

Print Vendor Instructions

How to use this file Operator's Manuals

- Paper Size:**
- 11x17
 - Body - 50 lbs brilliant white offset or equivalent
 - Cover - on pre-printed two tone "Swash" stock.
- Press:**
- Body - 1 color, 2-sided
 - Cover - 1 color, 1 sided
- Bindery:**
- Saddle stitch, face trim *if too thick for saddle stitch, tape bind
- Covers:**
- FRONT COVER is present at the beginning of the file.
 - BACK COVER is present at the end of the file.
 - The part number for this manual (typically a 172_____ number) is located on the front cover.
 - This file may contain several manual which differ only by their covers. See the part number at the bottom of the cover page. .
- Body:**
- The body for all manuals is identical regardless of the cover.
 - Odd number pages are always right hand pages, even number pages are always left hand pages.
- General:**
- This instruction sheet is NOT part of the manual and must not be printed.
 - Pages labeled "THIS PAGE INTENSIONALLY BLANK" are placement pages and should NOT be printed.

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OPERATOR'S MANUAL



Lancer / 4400 Series

Hydro Tractors

Mfg. No.	Description
1694106	Lancer, 15HP Hydro (CE)
1694255	4416, 15HP Hydro (CE)
1694292	Lancer, 17HP Hydro
1694294	4417, 17HP Hydro
1694317	Lancer, 17HP Hydro (CE)
1694319	4416, 17HP Hydro (CE)
1694320	4417, 17HP Hydro (CE)
1694348	4416, 17HP Hydro
1694374	Rapid 2006, 17HP Hydro (CE)
1694772	Lancer, 16HP Hydro (CE)
1694785	4416XL, 16HP Hydro (CE)
1694786	Lancer, 16HP Hydro (CE)
1694787	4416XL, 16HP Hydro (CE)
2690020	Lancer, 17HP Hydro & 44" Mower
2690021	4417, 17HP Hydro & 44" Mower
2690023	4417, 17HP Hydro & 40" Mower
2690050	Lancer, 16HP Hydro & 44" Mower
2690051	4417, 17HP Hydro & 44" Mower
2690070	4417, 17HP Hydro (CE) & 40" Mower
2690373	Lancer, 16HP Hydro (CE) & 40" Mower
2690374	4416XL, 16HP Hydro (CE) & 40" Mower
2690375	Lancer, 16HP Hydro (CE) & 44" Mower
2690376	4416XL, 16HP Hydro (CE) & 40" Mower
2690501	Lancer, 16HP Hydro (CE) & 44" Mower
2690502	4416XL, 16HP Hydro (CE) & 44" Mower

40" Mower Decks

Mfg. No.	Description
1694109	40" Mower Deck (CE)
1694257	40" Mower Deck (CE)
1694297	40" Mower Deck
1694298	40" Mower Deck
1694344	40" Mower Deck (CE)
1694345	40" Mower Deck (CE)

44" Mower Decks

Mfg. No.	Description
1694110	44" Mower Deck (CE)
1694258	44" Mower Deck (CE)
1694291	44" Mower Deck
1694293	44" Mower Deck
1694783	44" Mower Deck (CE)
1694784	44" Mower Deck (CE)
1695029	44" Mower Deck (CE)
1695035	44" Mower Deck (CE)

1723752

Revision 13

Revision Date 02/2007

TP 100-2591-13-LN-SMA



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NOTE: In this manual, "left" and "right" are referred to as seen from the operating position.



Operating Safety

Congratulations on purchasing a superior-quality piece of lawn and garden equipment. Our products are designed and manufactured to meet or exceed all industry standards for safety.

Power equipment is only as safe as the operator. If it is misused, or not properly maintained, it can be dangerous! Remember, you are responsible for your safety and that of those around you.

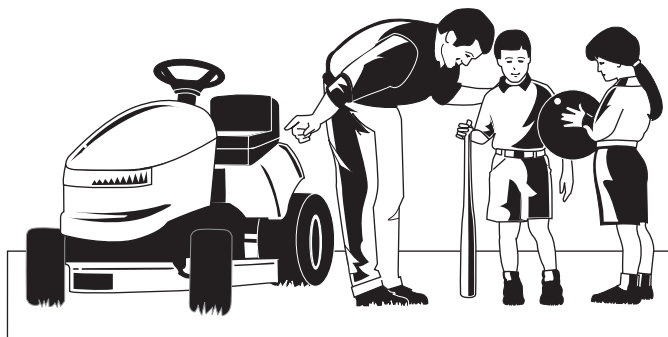
Use common sense, and think through what you are doing. If you are not sure that the task you are about to perform can be safely done with the equipment you have chosen, ask a professional: contact your local authorized dealer.

Read the Manual

The operator's manual contains important safety information you need to be aware of **BEFORE** you operate your unit as well as **DURING** operation.

Safe operating techniques, an explanation of the product's features and controls, and maintenance information is included to help you get the most out of your equipment investment.

Be sure to completely read the Safety Rules and Information found on the following pages. Also completely read the Operation section.



Children

Tragic accidents can occur with children. Do not allow them anywhere near the area of operation. Children are often attracted to the unit and mowing activity. Never assume that children will remain where you last saw them. If there is a risk that children may enter the area where you are mowing, have another responsible adult watch them.

DO NOT GIVE CHILDREN RIDES ON THIS UNIT! This encourages them to come near the unit in the future while it is running, and they could be seriously hurt. They may then approach the unit for a ride when you are not expecting it, and you may run over them.

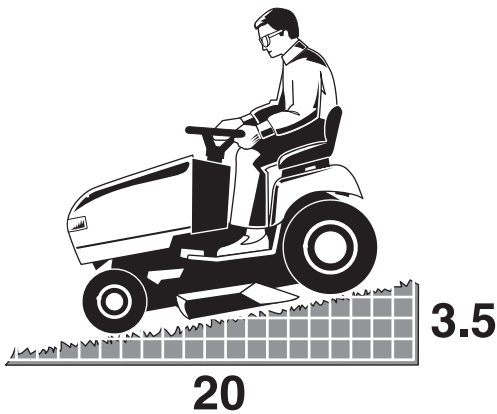
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Reverse

Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse even with the mower blades disengaged.



Slope Operation



You could be seriously injured or even killed if you use this unit on too steep an incline. Using the unit on a slope that is too steep or where you don't have adequate traction can cause you to lose control or roll over.

A good rule of thumb is to not operate on any slope you cannot back up (in 2-wheel drive mode). You should not operate on inclines with a slope greater than a 3.5 foot rise over a 20 foot length. Always drive up and down slopes: never cross the face.

Also note that the surface you are driving on can greatly impact stability and control. Wet grass or icy pavement can seriously affect your ability to control the unit.

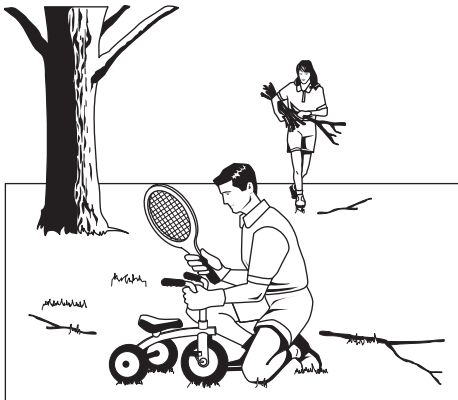
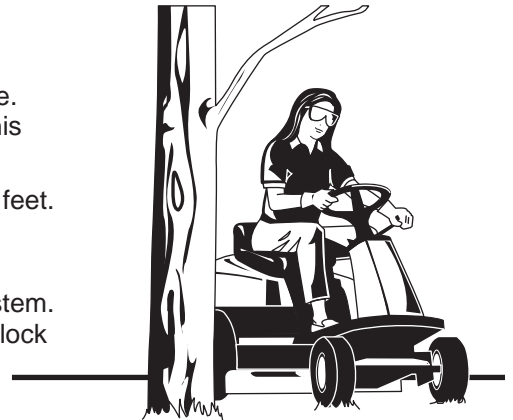
If you feel unsure about operating the unit on an incline, don't do it. It's not worth the risk.

Moving Parts

This equipment has many moving parts that can injure you or someone else. However, if you are seated in the seat properly, and follow all the rules in this book, the unit is safe to operate.

The mower deck has spinning mower blades that can amputate hands and feet. Do not allow anyone near the equipment while it is running!

To help you, the operator, use this equipment safely, it is equipped with an operator-present safety system. Do NOT attempt to alter or bypass the system. See your dealer immediately if the system does not pass all the safety interlock system tests found in this manual.



Thrown Objects

This unit has spinning mower blades. These blades can pick up and throw debris that could seriously injure a bystander. Be sure to clean up the area to be mowed BEFORE you start mowing.

Do not operate this unit without the entire grass catcher or discharge guard (deflector) in place.

Also, do not allow anyone in the area while the unit is running! If someone does enter the area, shut the unit off immediately until they leave.

Fuel and Maintenance

Gasoline is extremely flammable. Its vapors are also extremely flammable and can travel to distant ignition sources. Gasoline must only be used as a fuel, not as a solvent or cleaner. It should never be stored any place where its vapors can build up or travel to an ignition source like a pilot light. Fuel belongs in an approved, plastic, sealed gas can, or in the tractor fuel tank with the cap securely closed. Spilled fuel needs to be cleaned up immediately.

Proper maintenance is critical to the safety and performance of your unit. Be sure to perform the maintenance procedures listed in this manual, especially periodically testing the safety system.



Safety Rules & Information



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.

This mowing deck is capable of amputating hands and feet and throwing objects.

The triangle  in text signifies important cautions or warnings which must be followed.

GENERAL OPERATION

1. Read, understand, and follow all instructions in the manual and on the unit before starting.
2. Do not put hands or feet near rotating parts or under the machine. Keep clear of the discharge opening at all times.
3. Only allow responsible adults, who are familiar with the instructions, to operate the unit (local regulations can restrict operator age).
4. Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade(s).
5. Be sure the area is clear of other people before mowing. Stop the unit if anyone enters the area.
6. Never carry passengers.
7. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse.
8. Never direct discharge material toward anyone. Avoid discharging material against a wall or obstruction. Material may ricochet back toward the operator. Stop the blade(s) when crossing gravel surfaces.
9. Do not operate the machine without the entire grass catcher, discharge guard (deflector), or other safety devices in place.
10. Slow down before turning.
11. Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting.
12. Disengage blades (PTO) when not mowing. Shut off engine and wait for all parts to come to a complete stop before cleaning the machine, removing the grass catcher, or unclogging the discharge guard.
13. Operate the machine only in daylight or good artificial light.
14. Do not operate the unit while under the influence of alcohol or drugs.
15. Watch for traffic when operating near or crossing roadways.
16. Use extra care when loading or unloading the unit into a trailer or truck.
17. Always wear eye protection when operating this unit.
18. Data indicates that operators, age 60 years and above, are involved in a large percentage of power equipment-related injuries. These operators should evaluate their ability to operate the equipment safely enough to protect themselves and others from injury.
19. Follow the manufacturer's recommendations for wheel weights or counterweights.
20. Keep in mind the operator is responsible for accidents occurring to other people or property.
21. All drivers should seek and obtain professional and practical instruction.
22. Always wear substantial footwear and trousers. Never operate when barefoot or wearing sandals.
23. Before using, always visually check that the blades and blade hardware are present, intact, and secure. Replace worn or damaged parts.
24. Disengage attachments before: refueling, removing an attachment, making adjustments (unless the adjustment can be made from the operator's position).
25. When the machine is parked, stored, or left unattended, lower the cutting means unless a positive mechanical lock is used.
26. Before leaving the operator's position for any reason, engage the parking brake (if equipped), disengage the PTO, stop the engine, and remove the key.
27. To reduce fire hazard, keep the unit free of grass, leaves, & excess oil. Do not stop or park over dry leaves, grass, or combustible materials.
28. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on or near any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester meeting any applicable local or state laws. Other states or federal areas may have similar laws.

TRANSPORTING AND STORAGE

1. When transporting the unit on an open trailer, make sure it is facing forward, in the direction of travel. If the unit is facing backwards, wind lift could damage the unit.
2. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
3. Never store the unit (with fuel) in an enclosed poorly ventilated structure. Fuel vapors can travel to an ignition source (such as a furnace, water heater, etc.) and cause an explosion. Fuel vapor is also toxic to humans and animals.
4. Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
5. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
6. Never store the unit or fuel container inside where there is an open flame or pilot light, such as in a water heater. Allow unit to cool before storing.

SLOPE OPERATION

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. Operation on all slopes requires extra caution. If you cannot back up the slope or if you feel uneasy on it, do not operate on it.

Control of a walk-behind or ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are: insufficient tire grip on the ground, speed too fast, inadequate braking, the type of machine is unsuitable for its task, lack of awareness of the ground conditions, incorrect hitching and load distribution.

1. Mow up and down slopes, not across.
2. Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
3. Choose a slow speed so that you will not have to stop or change speeds while on the slope.
4. Do not mow on wet grass. Tires may lose traction.
5. Always keep unit in gear especially when traveling down slopes. Do not shift to neutral and coast downhill.
6. Avoid starting, stopping, or turning on a slope. If tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.
7. Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction, which could cause the machine to rollover.
8. Use extra care while operating machines with grass catchers or other attachments; they can affect the stability of the unit. Do not use on steep slopes.
9. Do not try to stabilize the machine by putting your foot on the ground (ride-on units).
10. Do not mow near drop-offs, ditches, or embankments. The mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
11. Do not use grass catchers on steep slopes.
12. Do not mow slopes you cannot back up them.
13. See your authorized dealer/retailer for recommendations of wheel weights or counterweights to improve stability.
14. Remove obstacles such as rocks, tree limbs, etc.
15. Use slow speed. Tires may lose traction on slopes even through the brakes are functioning properly.
16. Do not turn on slopes unless necessary, and then, turn slowly and gradually downhill, if possible.

TOWED EQUIPMENT (RIDE-ON UNITS)

1. Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.
2. Follow the manufacturer's recommendations for weight limit for towed equipment and towing on slopes.
3. Never allow children or others in or on towed equipment.
4. On slopes, the weight of the towed equipment may cause loss of traction and loss of control.
5. Travel slowly and allow extra distance to stop.
6. Do not shift to neutral and coast downhill.

WARNING

Never operate on slopes greater than 17.6 percent (10°) which is a rise of 3-1/2 feet (106 cm) vertically in 20 feet (607 cm) horizontally.

When operating on slopes use additional wheel weights or counterweights. See your dealer/retailer to determine which weights are available and appropriate for your unit.

Select slow ground speed before driving onto slope. In addition to front weights, use extra caution when operating on slopes with rear-mounted grass catchers.

Mow UP and DOWN the slope, never across the face, use caution when changing directions and **DO NOT START OR STOP ON SLOPE.**

CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the mowing activity. Never assume that children will remain where you last saw them.

1. Keep children out of the mowing area and under the watchful care of another responsible adult.
2. Be alert and turn unit off if children enter the area.
3. Before and during reverse operation, look behind and down for small children.
4. Never carry children, even with the blade(s) off. They may fall off and be seriously injured or interfere with safe unit operation. Children who have been given rides in the past may suddenly appear in the mowing area for another ride and be run over or backed over by the machine.
5. Never allow children to operate the unit.
6. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

EMISSIONS

1. Engine exhaust from this product contains chemicals known, in certain quantities, to cause cancer, birth defects, or other reproductive harm.
2. Look for the relevant Emissions Durability Period and Air Index information on the engine emissions label.

IGNITION SYSTEM

1. This spark ignition system complies with Canadian ICES-002.

Safety Rules & Information

SERVICE AND MAINTENANCE

Safe Handling of Gasoline

1. Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
2. Use only approved gasoline containers.
3. Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.
4. Never fuel the machine indoors.
5. Never store the machine or fuel container where there is an open flame, spark, or pilot light such as near a water heater or other appliance.
6. Never fill containers inside a vehicle or on a truck bed with a plastic bed liner. Always place containers on the ground away from your vehicle before filling.
7. Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
8. Keep nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
9. If fuel is spilled on clothing, change clothing immediately.
10. Never over-fill the fuel tank. Replace gas cap and tighten securely.
11. Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
12. If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
13. Replace all fuel tank caps and fuel container caps securely.
13. If the fuel tank must be drained, it should be drained outdoors.
14. Replace faulty silencers/mufflers.
15. Use only factory authorized replacement parts when making repairs.
16. Always comply with factory specifications on all settings and adjustments.
17. Only authorized service locations should be utilized for major service and repair requirements.
18. Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.
19. On multiple blade mowers, take care as rotating one blade can cause other blades to rotate.
20. Do not change engine governor settings or over-speed the engine. Operating the engine at excessive speed can increase the hazard of personal injury.
21. Disengage drive attachments, stop the engine, remove the key, and disconnect the spark plug wire(s) before: clearing attachment blockages and chutes, performing service work, striking an object, or if the unit vibrates abnormally. After striking an object, inspect the machine for damage and make repairs before restarting and operating the equipment.
22. Never place hands near the moving parts, such as a hydro pump cooling fan, when the tractor is running. (Hydro pump cooling fans are typically located on top of the transaxle).
23. Units with hydraulic pumps, hoses, or motors: **WARNING:** Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result. Keep body and hands away from pin holes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, and not hands, to search for leaks. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. If leaks occur, have the unit serviced immediately by your authorized dealer.

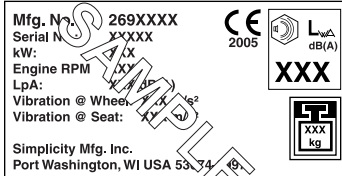
Service & Maintenance

1. Never run the unit in an enclosed area where carbon monoxide fumes may collect.
2. Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
3. Never tamper with safety devices. Check their proper operation regularly and make necessary repairs if they are not functioning properly.
4. Keep unit free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage. and remove any fuel-soaked debris. Allow machine to cool before storage.
5. If you strike an object, stop and inspect the machine. Repair, if necessary, before restarting.
6. Never make adjustments or repairs with the engine running.
7. Check grass catcher components and the discharge guard frequently and replace with manufacturer's recommended parts, when necessary.
8. Mower blades are sharp. Wrap the blade or wear gloves, and use extra caution when servicing them.
9. Check brake operation frequently. Adjust and service as required.
10. Maintain or replace safety and instructions labels, as necessary.
11. Do not remove the fuel filter when the engine is hot as spilled gasoline may ignite. Do not spread fuel line clamps further than necessary. Ensure clamps grip hoses firmly over the filter after installation.
12. Do not use gasoline containing METHANOL, gasohol containing more than 10% ETHANOL, gasoline additives, or white gas because engine/fuel system damage could result.
24. **WARNING:** Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.
25. Models equipped with an engine radiator: **WARNING:** Stored energy device. To prevent serious bodily injury from hot coolant or steam blow-out, never attempt to remove the radiator cap while the engine is running. Stop the engine and wait until it is cool. Even then, use extreme care when removing the cap.

Identification Numbers



North American /
CE Models



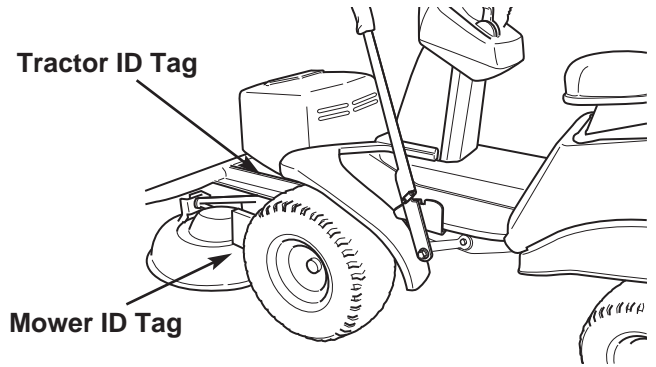
CE Models
(Only)

When contacting your authorized dealer for replacement parts, service, or information you **MUST** have these numbers.

Record your model name/number, manufacturer's identification numbers, and engine serial numbers in the space provided for easy access. These numbers can be found in the locations shown.

NOTE: For location of engine identification numbers, refer to the engine owner's manual.

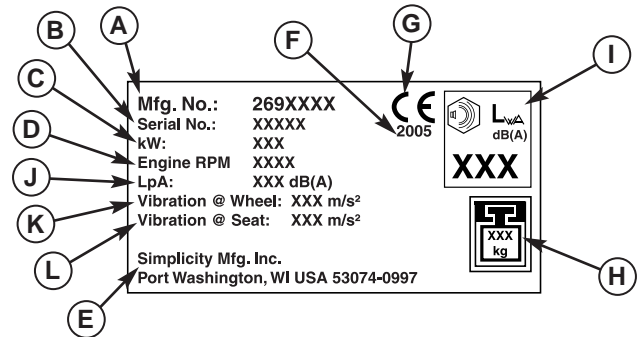
CE Models: Place the extra copy of the identification tag in the manual



PRODUCT REFERENCE DATA	
Model Description Name/Number	
Unit MFG Number	Unit SERIAL Number
Mower Deck MFG Number	Mower Deck SERIAL Number
Dealer Name	Date Purchased
ENGINE REFERENCE DATA	
Engine Make	Engine Model
Engine Type/Spec	Engine Code/Serial Number

CE IDENTIFICATION TAG MARKINGS

- A. Manufacturer's Identification Number
- B. Manufacturer's Serial Number
- C. Power Rating in Kilowatts
- D. Maximum Engine Speed in Rotations per Minute
- E. Manufacturer's Address
- F. Year of Manufacture
- G. CE Compliance Logo
- H. Mass of Unit in Kilograms
- I. Sound Power in Decibels ***
- J. Sound Pressure at Operator's Position in Decibels **
- K. Vibration at the Steering Wheel *
- L. Vibration at the Seat *



This unit complies with European Harmonized Lawn Mower Standard EN 836, European Machinery Directive 98/37/EC, and European EMC Directive 89/336/EC

* Tested according to EN 836:1997/A2:2001, EN 1032:1996, EN 1033:1995

** Tested according to EN836:1997/A2:2001

*** Tested according to 2000/14/EC

*CE Models:
Place copy of
Identification Tag here.*

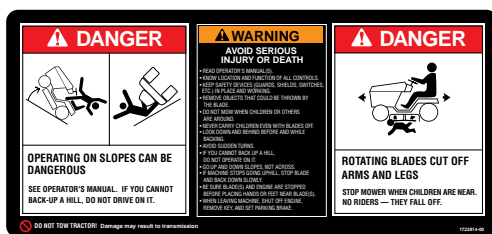
Safety Decals

SAFETY DECALS

This unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your unit.

NORTH AMERICAN MODELS



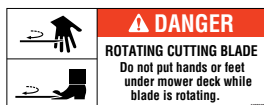
Decal - Operating Instructions, North American Models, Part No. 1722814



Decal - Danger, Side-Discharge Models
Part No. 1704276



Decal - Danger, Side-Discharge Models
Part No. 1704277



Decal - Danger, Mulching Models
Part No. 1720660

CE MODELS



Decal - Operating Instructions, CE Models,
Part No. 1734027



Decal - Danger, Shear
Part No. 1723823

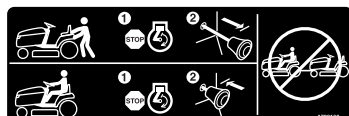


Decal - Remove Key &
Read Operator's Manual
Before Servicing
Part No. 1723824

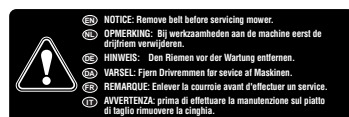


Decal - Danger, Rotating Blades
Part No. 1720389

ALL MODELS



Decal - Transmission
Release
Part No. 1723160



Decal - Remove Belt
Part No. 1723786



Decal - Ignition Switch
Part No. 1723826

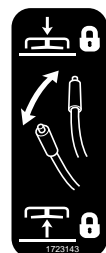


Decal - Cutting Height
Part No. 1723825



Decal - Cutting Height
Part No. 1723470

Decal - Attachment Lift
Part No. 1723143



SAFETY ICONS

Warning: Read Operator's Manual.

Read and understand the Operator's Manual before using this machine.



Danger: Thrown Objects.

This machine is capable of throwing objects and debris. Keep bystanders away.



Warning: Remove Key Before Servicing.

Remove the key and consult technical literature before performing repairs or maintenance.



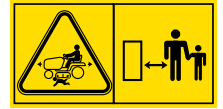
Danger: Machine Rollover.

Do not use this machine on slopes greater than 10°.



Danger: Dismemberment.

This machine can amputate limbs. Keep bystanders and children away when engine is running.



Danger: Dismemberment.

This mower deck can amputate limbs. Keep hands and feet away from blades.



Danger: Shear Point.

Mechanical components in this area can amputate limbs. Keep hands away.



Danger: Remove Key & Read Manual Before Servicing

Remove the key and read the operator's manual before performing service procedures involving components in this area.



A black and white photograph of a riding lawn mower. It features a large, dark-colored engine compartment on the left side of the seat. The seat is high-backed and has a steering wheel in front of it. The mower has two large, treaded rear wheels and two smaller front wheels. A cutting deck is mounted at the front, and there are some smaller wheels or rollers underneath it. The overall design is functional and typical of a commercial or heavy-duty residential lawn care vehicle.

NOTE: Steering wheel removed for clarity

The diagram shows a top-down view of a riding mower. Various controls are labeled with icons in black boxes. On the left side, there are two sets of icons: 'Duel Lever Models' (a rabbit and a turtle) and 'Single Lever Models' (a rabbit and a turtle). At the top, there is a headlight icon. On the right side, there is a parking brake icon (a circle with a 'P'), a reverse gear icon (a circle with a dot), a forward/reverse lever icon (a vertical bar with arrows), a gear selector icon (a circle with a gear), a parking brake icon (a circle with a 'P'), and a shopping cart icon. At the bottom, there is a fuel tank icon (a gas pump) and a parking brake icon (a circle with a 'P').

Duel Lever Models

Single Lever Models

Please take a moment and familiarize yourself with the name, location, and function of these controls so that you will better understand the safety and operating instructions provided in this manual.

Figure Mower

Figure 1. Tractor and Mower Controls

The information below briefly describes the function of individual controls. Starting, stopping, driving, and mowing require the combined use of several controls applied in specific sequences. To learn what combination and sequence of controls to use for various tasks see the OPERATION section.



(Single Lever Models)

The throttle/choke lever controls engine speed and choke. Move the throttle forward to increase engine speed and back to decrease engine speed. Always operate at FULL throttle. Move the control fully forward (past the detent) to close the choke. Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require choking.



(Dual Lever Models)

The throttle controls engine speed. Move the throttle forward to increase engine speed and back to decrease engine speed. Always operate at FULL throttle.



(Dual Lever Models)

Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require chocking. Move the lever forward to close the choke.



Attachment Lift Control Lever

When using the mower deck, lift the deck off the ground while transporting to and from the job site. **DO NOT** cut with the mower in the raised, transport position.

The attachment lift control lever raises and lowers attachments that utilize the tractor's manual lift linkage. To lower an attachment: pull the lever back slightly, then push the lever forward. To raise an attachment: pull the lever back and lock it in the raised position.

The attachment lift lever has three positions. The back position is for transporting to and from the work site. The middle notch provides maximum traction when mowing on hills. The forward position provides the most downward pressure giving the best cut.



Mower Height of Cut Adjustment

The cutting height adjustment knob controls the mower cutting height. The cutting height is infinitely adjustable between 1" (2,5 cm) and 3-3/4" (9,5 cm).



Headlights

The headlight switch turns the tractor headlights on and off.



Brake Pedal

Depressing the brake pedal applies the tractor brake.



Ground Speed Pedals

The tractor's forward ground speed is controlled by the forward ground speed control pedal. The tractor's reverse ground speed is controlled by the reverse ground speed control pedal.

Depressing either pedal will increase ground speed. Note that the further down the pedal is depressed, the faster the tractor will travel.



PTO Switch

The PTO (Power Take-Off) switch engages and disengages attachments that use the PTO. To engage the PTO, pull UP on the switch. Push DOWN to disengage. *Note that the operator must be seated firmly in the tractor seat for the PTO to function.*



Ignition Switch

The ignition switch starts and stops the engine, it has three positions:



OFF Stops the engine and shuts off the electrical system.



RUN Allows the engine to run and powers the electrical system.



START Cranks the engine for starting.

NOTE: Never leave the ignition switch in the RUN position with the engine stopped—this drains the battery.



Parking Brake

The parking brake knob is used to lock the parking brake when the tractor is stopped. Fully depressing the brake pedal and pulling up on the knob engages the parking brake. Refer to page 10 for a full explanation of parking brake functions.



Seat Adjustment Lever

The seat can be adjusted forward and back. Move the lever, position the seat as desired, and release the lever to lock the seat into position.



Fuel Tank & Gauge

The fuel gauge is located in the filler cap and indicates the amount of fuel in the tank. To refuel the unit, remove the fill cap and fill to just below the filler neck.



Transmission Release Valve Lever

The transmission release valve lever deactivates the transmission so that the tractor can be pushed by hand. See PUSHING THE TRACTOR BY HAND for operational information.

PARKING BRAKE FUNCTION

Applying the Parking Brake - See Figure 2. To lock the parking brake, release the ground speed pedals (A), fully depress the brake pedal (B), pull UP on the parking brake knob (C), and then release brake pedal.

Releasing the Parking Brake - See Figure 2. To release the parking brake, fully depress the brake pedal (B) and push the parking brake knob (C) DOWN.

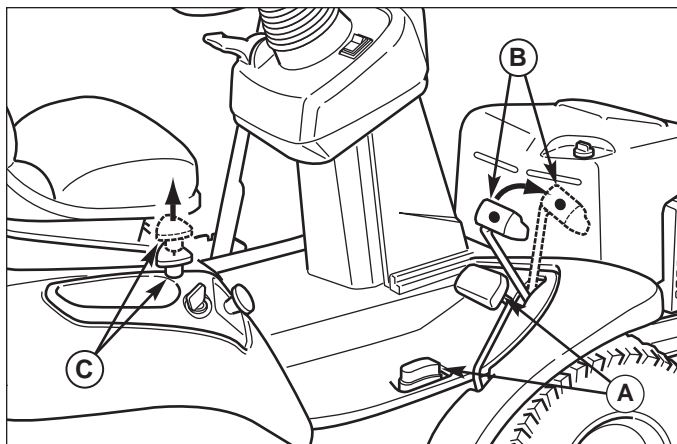


Figure 2. Engaging the Parking Brake

A. Ground Speed Pedals

B. Brake Pedal

C. Parking Brake Knob



Operating the Tractor



SAFETY INTERLOCK SYSTEM TESTS

This unit is equipped with safety interlock switches and other safety devices. These safety systems are present for your safety: do not attempt to bypass safety switches, and never tamper with safety devices. Check their operation regularly.

Operational SAFETY Checks

Your unit is equipped with a seat switch safety system. Check the seat switch operation every fall and spring with the following tests.

Test 1 — Engine should NOT crank if:

- PTO switch is ON, OR
- Brake pedal is NOT fully depressed (parking brake OFF), OR

Test 2 — Engine SHOULD crank if:

- PTO switch is OFF, AND
- Brake pedal is fully depressed (parking brake ON), AND

Test 3 — NORTH AMERICAN MODELS — Engine should SHUT OFF if:

- Operator rises off seat with PTO engaged, OR
- Operator rises off seat with brake pedal NOT fully depressed (parking brake OFF).

Test 3 — CE MODELS — Engine should SHUT OFF if:

- Operator rises off seat.

Test 4 — Blade Brake Check

Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned OFF (or operator rises off seat). If mower drive belt does not stop within five seconds, readjust the PTO clutch as described in the ADJUSTMENTS section or see your dealer.



WARNING

If the unit does not pass a safety test, do not operate it. See your authorized dealer. Under no circumstance should you attempt to defeat the purpose of the safety interlock system.

GENERAL OPERATING SAFETY

Be sure to read all information in the Safety and Operation sections before attempting to operate this unit. Become familiar with all of the controls and how to stop the unit.

ADDING FUEL

To add fuel:

1. Remove the fuel cap (see Figure 1).
2. Fill the tank. Do not overfill. Leave room in the tank for fuel expansion. Refer to your engine manual for specific fuel recommendations.
3. Install and hand tighten the fuel cap.



Do not use gasoline containing METHANOL, gasohol containing more than 10% ETHANOL, gasoline additives, or white gas because engine/fuel system damage could result.



WARNING

Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do not allow open flame, smoking or matches in the area. Avoid over-filling and wipe up any spills.

STARTING THE ENGINE

1. While sitting in the operator's seat, fully depress the brake pedal or set the parking brake.
 2. Make sure that your feet are not depressing the ground speed control pedals.
 3. Disengage the PTO clutch.
 4. Set the throttle to FULL.
 5. Close the choke.
- NOTE: A warm engine may not require choking.*
6. Insert the ignition key and turn it to START.
 7. After the engine starts, move the engine throttle control to SLOW. Warm up the engine by running it for at least a minute.
 8. Set throttle to FULL.

NOTE: In the event of an emergency the engine can be stopped by simply turning the ignition switch to STOP. Use this method only in emergency situations. For normal engine shut down follow the procedure given in STOPPING THE TRACTOR.

Operating the Tractor

STOPPING THE TRACTOR & ENGINE

1. Return the ground speed control(s) to neutral.
2. Disengage the PTO and wait for all moving parts to stop.
3. Place the throttle control in the position specified in the engine owner's manual provided in the operator's packet shipped with your tractor. Follow any recommended stopping procedures.
4. Turn the ignition switch to OFF. Remove the key.

DRIVING THE TRACTOR

1. Sit in the seat and adjust the seat so that you can comfortably reach all the controls.
2. Engage the parking brake.
3. Make sure the PTO switch is disengaged.
4. Start the engine (see STARTING THE ENGINE).
5. Disengage the parking brake and release the brake pedal.
6. Depress the forward ground speed control pedal to travel forward. Release the pedal to stop. Note that the further down the pedal is depressed the faster the tractor will travel.
7. Stop the tractor by releasing the ground speed control pedals, setting the parking brake, and stopping the engine (see STOPPING THE TRACTOR AND ENGINE).

PUSHING THE TRACTOR BY HAND

1. Disengage the PTO and turn the engine off.
2. Pull the transmission release back approximately 2-1/2" (6 cm) to lock into released position (Figure 3).
3. The tractor can now be pushed by hand.



DO NOT TOW TRACTOR

Towing the unit will cause transmission damage. • Do not use another vehicle to push or pull this unit. • Do not actuate the transmission release valve lever while the engine is running.

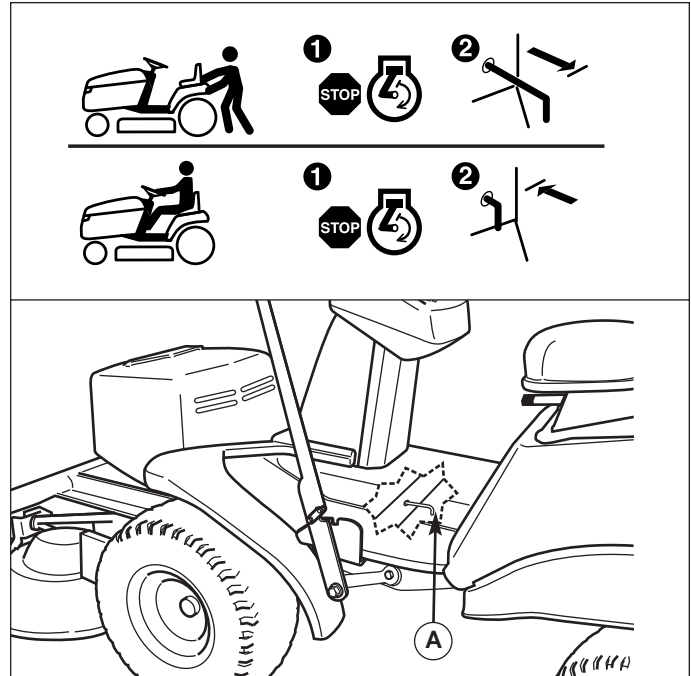


Figure 3. Transmission Release Lever
A. Transmission Release Lever

MOWING

1. Engage the parking brake. Make sure the PTO switch is disengaged.
2. Set the mower cutting height to the desired level.
3. Start the engine (see STARTING THE ENGINE).
4. Lower the mower lift lever.
5. Set the throttle to FULL.
6. Engage the front PTO (Mower Deck).
7. Begin mowing. See Section C for tips on mowing patterns, lawn care, and trouble shooting information.
8. When finished, shut off the PTO and raise the mower lift lever.
9. Stop the engine (see STOPPING THE TRACTOR AND ENGINE).

USING A MULCHING MOWER (40" MOWER ONLY)

Benefits of Proper Mulching

Mulching consists of a mower deck which cuts and recuts clippings into tiny particles and then blows them down into the lawn. These tiny particles decompose rapidly into by-products that your lawn can use. Under proper conditions your mulching mower virtually eliminates noticeable clippings on the lawn surface.

Limitations of Mulching Decks

Mulching mowers cannot function properly if the grass is wet, or if the grass is simply too high. Even more than normal mowing, mulching requires that the grass be dry and that no more than 1/3 of the height is cut.

Do not use the mower as a mulching mower during the first two or three cuttings in the spring. The long grass blades, quick growth, and often wetter conditions are more suitable for broadcasting (side-discharging).

Correct Ground Speed & Engine Speed

Use full engine throttle to maximize mower blade tip speed matched with a slow ground speed so that clippings will be finely cut. Ground speed while mulching should be half the speed used when broadcasting (side-discharging) under similar conditions. Since mulching requires more horse power than broadcasting, using a proper ground speed is vitally important for good mulching operation.

Correct Cutting Height

Cutting off too much at one time shocks the plant's growth system and weakens the grass. A good rule of thumb is the 1/3 rule: to cut no more than one third of the grass height, and never more than 1 inch (2,5 cm) at a time.

The best mulching action typically results from cutting only the top 1/2" (1,3 cm) to 3/4" (2 cm) of the grass blade. This provides short clippings which decompose properly (much more quickly than longer clippings). The ideal cutting height will vary with climate, time of year, and quality of your lawn. We recommend that you experiment with both the cutting height and ground speed to achieve the best cut. Start with a high cutting height and use progressively lower heights until you find a cutting height that is matched to your mowing conditions and preferences. For best results, overlapping is recommended.

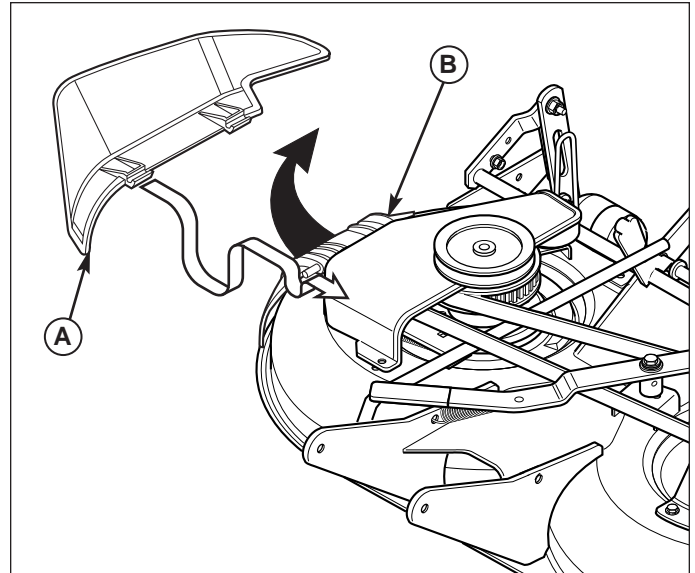


Figure 4. Installing the Side Discharge Deflector
A. Side Discharge Deflector
B. Mulching Cover

Using the Side Discharge Deflector

When to use the side discharge deflector: If you've been on vacation or missed a mowing and the grass has gotten very long, do not try to mulch at your normal cutting height. To handle these situations your mulching mower is equipped with a side discharge deflector. Installing the side discharge deflector allows you to broadcast clippings. Broadcasting, or side-discharging, disperses fine clippings evenly over the entire lawn. Always operate the engine at full throttle. Use an appropriate ground speed for the thickness and height of grass you are cutting. If you hear the engine slowing down, you are mowing too fast, use a slower ground speed. Mow when the grass is 3"-5" long (7,6-12,7 cm). Do not cut off more than 1" (2,5 cm) in a single pass.

WARNING

Never operate the mower deck without either the discharge chute or mulching deflector in place.

To install the side discharge chute:

1. Lift up the mulching cover (B, Figure 4).
2. Install the side discharge deflector (A) under the mulching cover. The side discharge deflector hooks onto the mulching cover hinge rod, and is held in place by the mulching cover.
3. Release the mulching cover.

Operating the Tractor

ADJUSTING MOWER CUTTING HEIGHT

The cutting height adjustment knob (A, Figure 5) controls the mower cutting height. Turn the knob clockwise to raise the deck and counterclockwise to lower it.

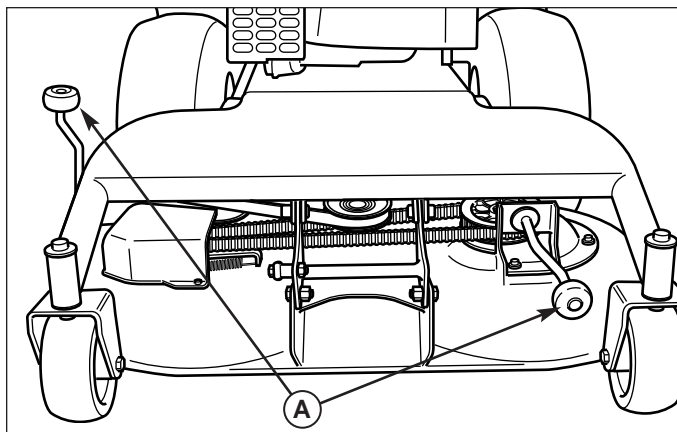


Figure 5. Raising & Lowering Mower
A. Mower Height Adjuster

WARNING

Engage parking brake, disengage PTO, stop engine and remove key before pivoting the mower.

MOWER DECK SERVICE ACCESS

Pivoting the Mower Deck Up

1. Engage the parking brake, disengage the PTO, stop the engine, and remove the key.
2. Place the mower lift lever between the raised and lowered notches. Place the height of cut control in the lowest position.
3. Using the spring-loaded idler lever (A, Figure 6), release tension on the PTO belt and remove the belt from the engine pulley.
4. Remove the pins and clips (B, Figure 6) from both sides of the frame.

WARNING

SHEAR POINT HAZARD: Keep hands and feet away from the area between the mower frame and tractor frame when the mower is pivoted up or down.

5. Pivot the mower deck out from under the frame and hold it in place (see Figure 7).
6. Insert the pins and clips (B, Figure 7) through the safety holes (A) in the frame just behind the pivot hinge.

Pivoting the Mower Deck Down

1. Hold the mower deck in position and remove the clevis pins (B, Figure 7) from the safety holes (A).
2. Pivot the mower deck under the tractor. Be sure to keep hands and feet away from the area between the mower frame and tractor frame.

WARNING

SHEAR POINT HAZARD: Keep hands and feet away from the area between the mower frame and tractor frame when the mower is pivoted up or down.

3. Place the lift lever in the lowered position.
4. Install the clevis pins and clips (B, Figure 6).
5. Use the spring loaded idler lever (A, Figure 8) to release tension on the PTO belt (B). Install the PTO belt.

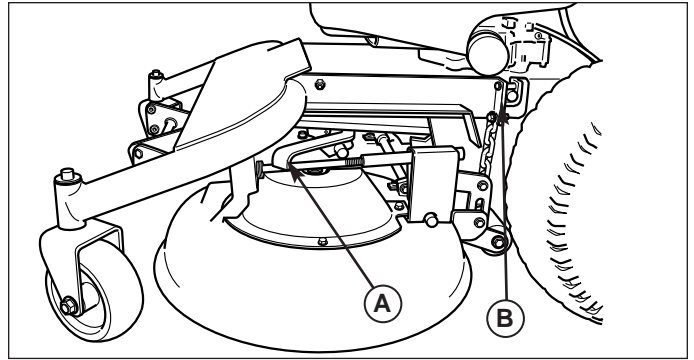


Figure 6. Mower Deck Access

A. Idler Lever

B. Pins & Clips (Both Sides)

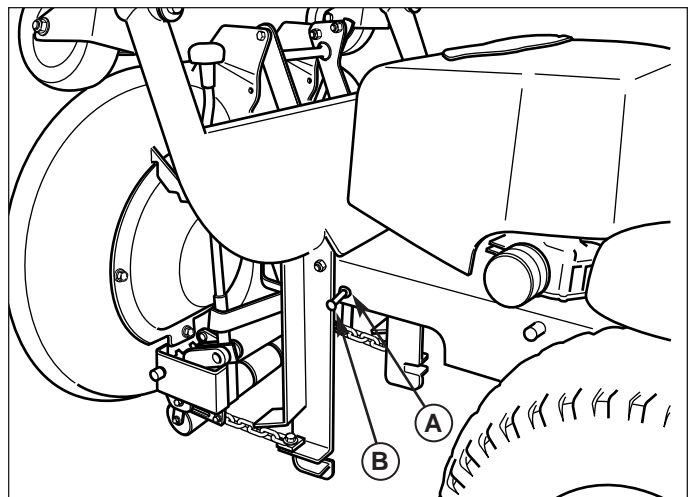


Figure 7. Mower Deck Access

A. Safety Hole Location

B. Pin and Clip

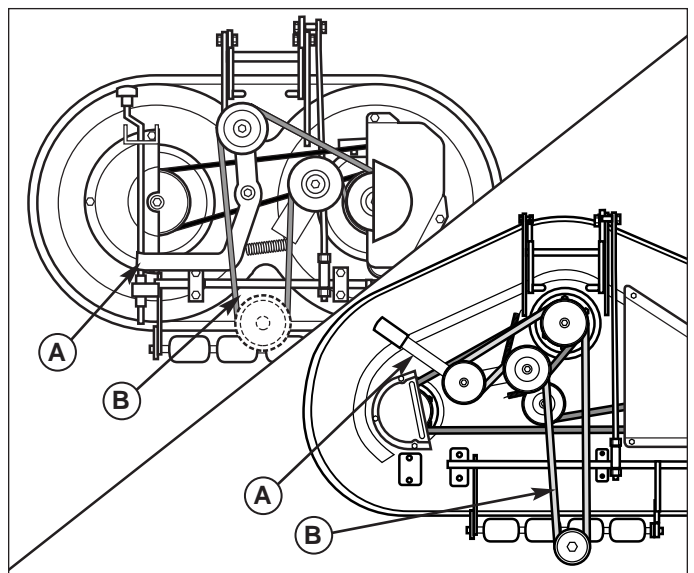


Figure 8. Mower Belt Routing

A. Idler Lever

B. PTO Belt

STORAGE

WARNING

Never store the unit (with fuel) in an enclosed, poorly ventilated structure. Fuel vapors can travel to an ignition source (such as a furnace, water heater, etc.) and cause an explosion.

Fuel vapor is also toxic to humans and animals.

Before you store your unit for the off-season, read the Maintenance and Storage instructions in the Safety Rules section, then perform the following steps:

- Disengage the PTO, set the parking brake, & remove the key.
- Perform engine maintenance and storage measures listed in the engine owner's manual. This includes draining the fuel system, or adding stabilizer to the fuel (do not store a fueled unit in an enclosed structure - see above).

- Battery life will be increased if it is removed, put in a cool, dry place and fully charged about once a month. If the battery is left in the unit, disconnect the negative cable.

Before starting the unit after it has been stored:

- Check all fluid levels. Check all maintenance items.
- Perform all recommended check and procedures found in the engine owner's manual.
- Allow the engine to warm up for several minutes before use.



Regular Maintenance

MAINTENANCE SCHEDULE

The following schedule should be followed for normal care of your tractor and mower. Use the hour meter to determine your operating time.

SAFETY ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Safety Interlock System						●
Check Tractor Brakes						●
Check Mower Blade Stopping Time				●		●
TRACTOR MAINTENANCE ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Tractor/Mower for loose hardware		●				
Check / Clean Cooling Fins				●		
Check / Adjust PTO Clutch			***●		●	
Lubricate Tractor & Mower **			●			
Lubricate Rear Axle Shafts						Yearly
Clean Battery & Cables				●		
Check Tire Pressure			●			
Clean Deck & Check/Replace Mower Blades **				●		
Perform Transmission Maint. (Varies by Model)					***●	
Check Mower Blade Timing (40" Mowers)						Yearly
Check Arbor Drive Belt Tension (40" Mowers)						Yearly
ENGINE MAINTENANCE ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Engine Oil Level	●					
Check / Change Engine Air Filter	These procedures and their service intervals can be found in the engine manufacturer's owner's manual. Always refer to the engine manual for engine-related information.					
Change Engine Oil & Filter *						
Inspect Spark Plug(s)						
Check / Replace Fuel Filter						

* Change original engine oil after initial break-in period. Refer to engine owner's manual.

** More often in hot (over 85° F: 30° C) weather or dusty operating conditions.

*** Service after the first 25 hours of operation, then every 250 hours of operation.

Regular Maintenance

CHECK TIRE PRESSURES

Service Interval: Every 25 Hours

Tire Pressure should be checked periodically, and maintained at the levels shown in the chart. Note that these pressures may differ slightly from the “Max Inflation” stamped on the side-wall of the tires. The pressures shown provide proper traction, improve cut quality, and extend tire life.

TRANSMISSION IDENTIFICATION

Several service procedures within this book are identified by, and vary by, transmission type. To determine what transmission is in your tractor, check the identification tag attached to the axle of the transmission (Figure 10), or check your tractor's parts book.

TRANSMISSION MAINTENANCE



Do not allow dirt, water, or other debris to enter the expansion chamber or transmission. Even a small amount of dirt can damage the transmission

K46 Maintenance

The K46 is a sealed unit and does not require regular maintenance. If the transmission lacks drive or is excessively noisy, it may need to be purged. See TRANSMISSION PURGING in the Troubleshooting, Adjustments, & Service Section.

SAFETY INTERLOCK SYSTEM CHECK

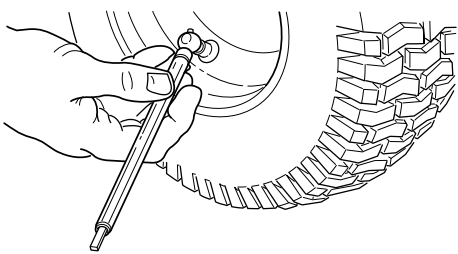
Service Interval: Every Fall & Spring

Check the function of the safety interlock system using the test procedure found on page 11 of this manual. If the tractor fails any of the tests, see your dealer.

PTO CLUTCH ADJUSTMENT CHECK

Service Interval: After 25 Hrs, Then Every 250 Hrs

Check the PTO clutch adjustment after the initial 25 hour break-in period and then after every 250 hours of operation—or if the clutch starts slipping or will not engage. Check and adjust the clutch using the procedure outlined in the Adjustments section of this manual.



Size	PSI	bar
18 x 8.50-8	15	1
15 x 6.00-6	12-15	,8-1

Figure 9. Tire Pressure

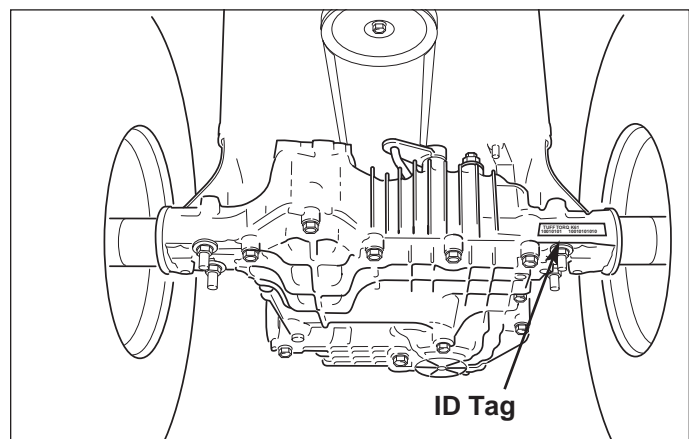


Figure 10. Transmission ID Tag Location

BLADE BRAKE CHECK

Service Interval: Every 100 Hours or Fall & Spring

Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned off.

1. With tractor in neutral, PTO disengaged and operator in seat, start the engine.
2. Look over the left-hand footrest at the mower drive belt. Engage the PTO and wait several seconds. Disengage the PTO and check the amount of time it takes for the mower drive belt to stop.
3. If mower drive belt does not stop within five seconds, re-adjust the clutch or see your dealer.

ENGINE MAINTENANCE

Refer to the engine owner's manual for all engine maintenance procedures and recommendations.

BATTERY MAINTENANCE

WARNING

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.

Cleaning the Battery and Cables

Service Interval: Every 100 Hours

1. Disconnect the cables from the battery, negative cable first (A, Figure 11).
2. Remove the battery hold-down (C) and battery.
3. Clean the battery compartment with a solution of baking soda and water.
4. Clean the battery terminals and cable ends with a wire brush and battery terminal cleaner until shiny.
5. Reinstall the battery in the battery compartment, and secure with the battery hold-down (C).
6. Reattach the battery cables, positive cable first (B).
7. Coat the cable ends and battery terminals with petroleum jelly or non-conducting grease.

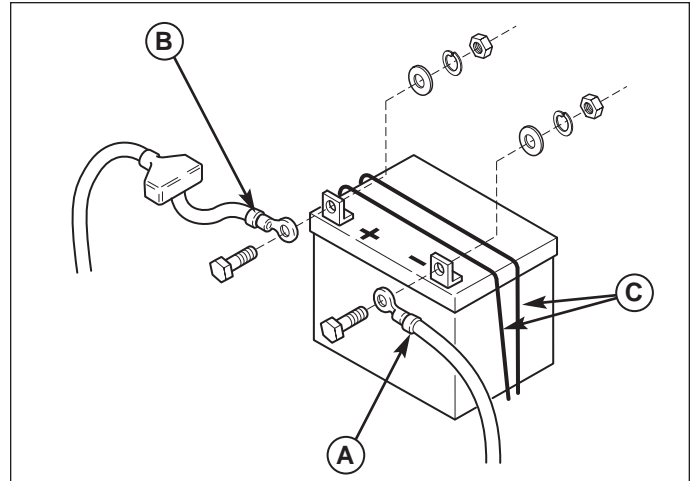


Figure 11. Battery
A. Negative Cable
B. Positive Cable & Cover
C. Hold-Down Strap

Regular Maintenance

LUBRICATION

Service Interval: Every 25 Hours

Lubricate the unit at the locations shown in Figures 12-14 as well as the lubrication points listed. Generally, all moving metal parts should be oiled where contact is made with other parts. Keep oil and grease off belts and pulleys. Wipe surfaces clean before and after lubrication.

Grease:



- steering linkage
- foot pedal
- mower linkage
- transmission idler assembly pivot
- rear axle shafts (remove wheel hubs)

Use grease fittings when present. Automotive lithium grease is recommended.

Oil:



- control linkage
- seat adjustment assembly
- brake linkage
- mower deck height adjustment linkage
- manual lift lever

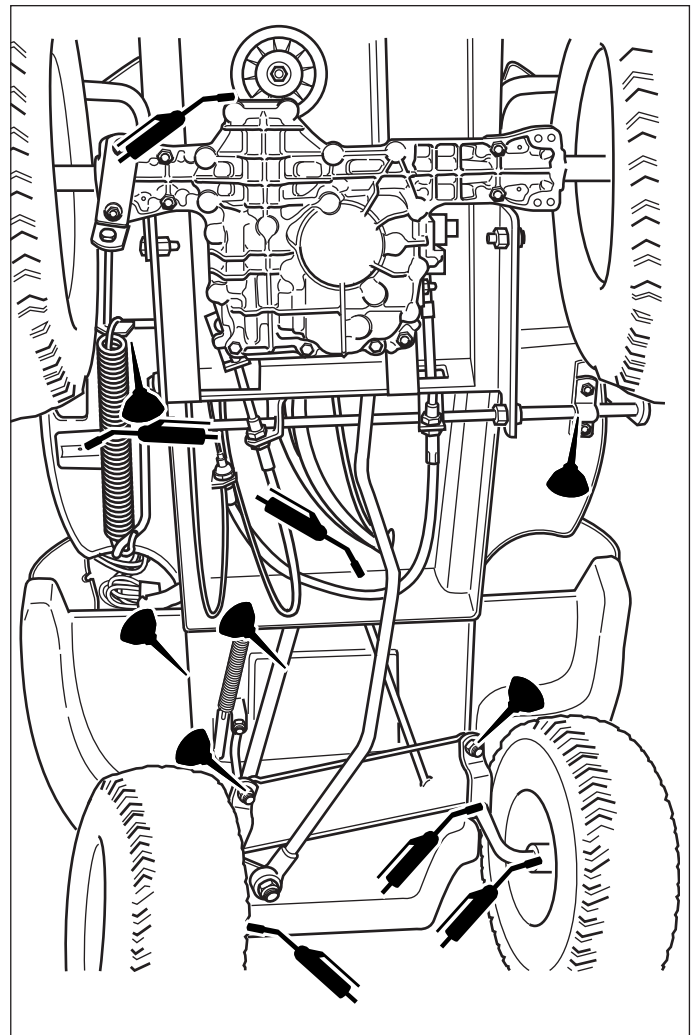


Figure 13. Lubricating the Tractor

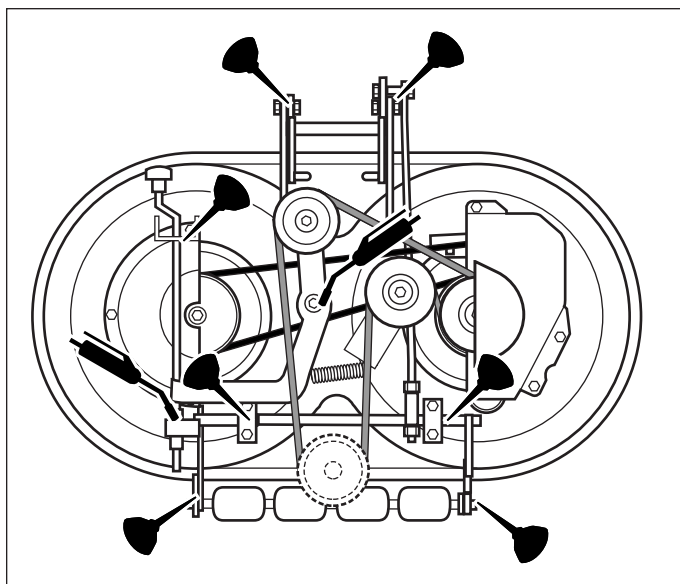


Figure 12. Mower Lubrication Points - 40"

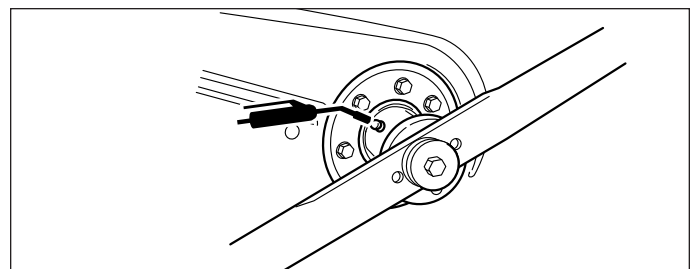


Figure 14. Arbor Lubrication Points

LUBRICATE AXLE SHAFTS

Service Interval: Yearly

We recommend removing the wheel hubs and lubricating the axle shafts yearly. This prevents the wheel hubs from seizing onto the axle shaft and makes future service easier.

1. Turn off the ignition, turn off the PTO, engage the parking brake, and block the front tires.
2. Using a jack or chain hoist positioned at the center of the rear frame, carefully jack the unit up until the front tires are approximately 1" - 2" (2,5-5cm) off the ground.

NOTE: For overall unit stability during service, do not jack higher than required for wheel removal.

3. Support the front of the unit on jackstands positioned under the rear frame.

NOTE: Your axle assembly may differ slightly from the assembly pictured: the quantity of washers is adjusted on a tractor by tractor basis during assembly to allow a small amount of axle end-play.

4. Remove the hardware retaining the wheel assembly to the axle and lubricate the axle shaft using anti-seize compound or lithium grease.
5. Reinstall the components in reverse order of disassembly and lower the unit. Be sure the key (A, Figure 15) is in place in the axle keyway.

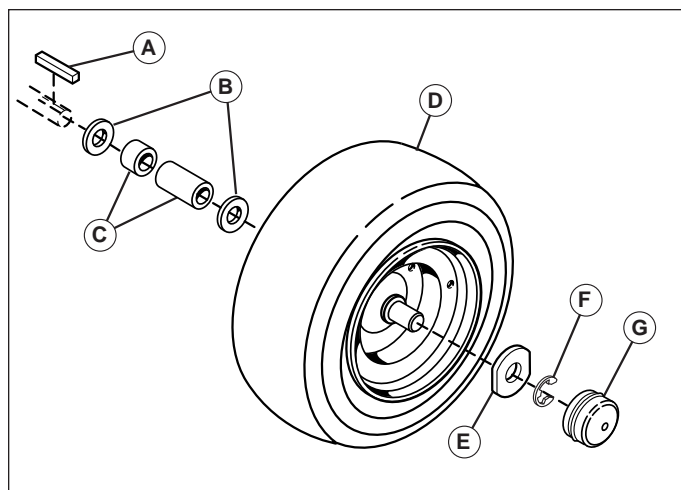


Figure 15. Axle Hardware

- | | |
|-----------------------------|-----------------------------|
| A. Key | E. Axle Cap Retainer |
| B. Stationary Washer | F. Retaining Ring |
| C. Spacer | G. Axle Cap |
| D. Wheel & Hub | |

Regular Maintenance

WARNING

For your personal safety, do not handle the sharp mower blades with bare hands. Careless or improper handling of blades may result in serious injury.

WARNING

For your personal safety, blade mounting capscrews must each be installed with a hex/spline washer and spring washer, then securely tightened. Torque blade mounting capscrew to 45 - 55 ft. lbs. (61 - 75 N.m.)

SERVICING THE MOWER BLADES

Service Interval: Every 100 Hours or As Required

NOTE: Mower blades must be timed perpendicular to each other.

1. Remove mower deck (see "Mower Deck Removal").
2. See Figure 16. To remove blade for sharpening, use a block of wood to prevent blade rotation while loosening the capscrew.
3. **44" Mowers:** Remove the capscrew (D, Figure 18), spring washer (C), hex washer (B), and blade.
- 40" Mowers:** Remove the capscrew (A, Figure 19), spring washer (F), spline washer (G), alignment pin (E) and blade (D). Do not remove the blade adapter (C).
4. Use a file to sharpen blade to a fine edge. If blade is severely damaged, it must be replaced.
5. Balance the blade as shown in Figure 17. Center the blade's hole on a nail lubricated with a drop of oil. A balanced blade will remain level.
6. Reinstall the blade (Figures 18 & 19) with the tabs pointing up toward the mower deck as shown. Reinstall the alignment pin (E).
7. **44" Mowers:** Reinstall the hex washer (B, Figure 18), spring washer (C) and capscrew (D). Use a wooden block (A) to prevent blade rotation while tightening the capscrew (D) to 61-75 N.m (45-55 ft. lbs.).
- 40" Mowers:** Be sure the blades are positioned perpendicular to each other as shown in Figure 20. If not, perform the Mower Blade Timing procedure found in this section. Reinstall the spline washer (G, Figure 19), spring washer (F) and capscrew (A). Use a wooden block (B) to prevent blade rotation while tightening the capscrew (A) to 61-75 N.m (45-55 ft. lbs.).

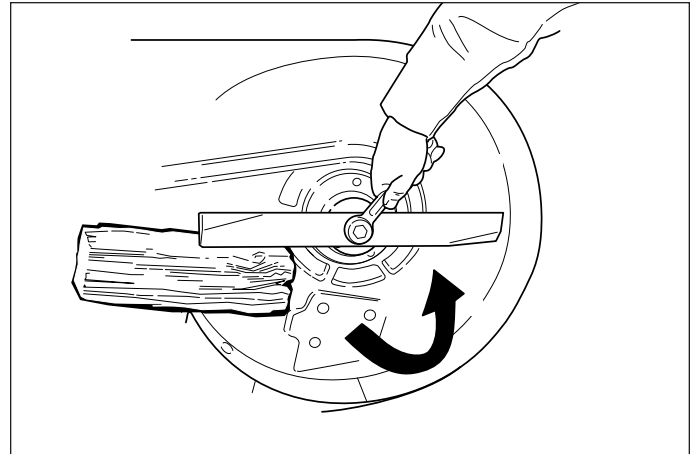


Figure 16. Blade Removal

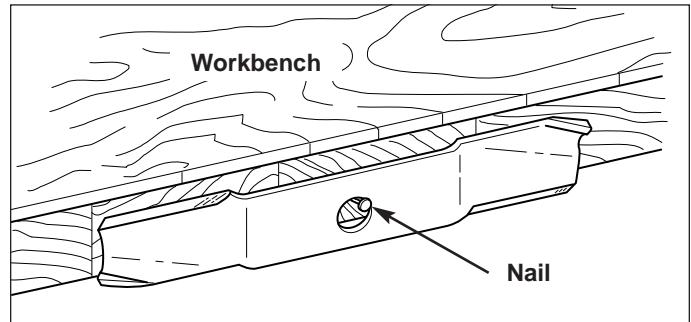


Figure 17. Balancing The Blade

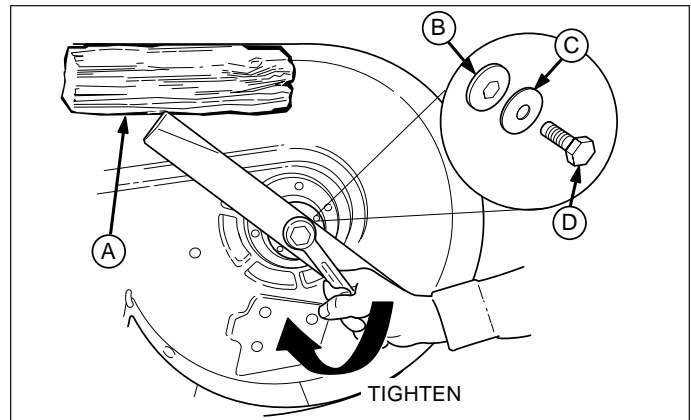


Figure 18. Installing The Blade - 44" Models
A. 4x4 Wood Block C. Spring Washer
B. Hex Washer D. Blade Bolt

CHECK MOWER BLADE TIMING - 40" MOWERS

Service Interval: Yearly

1. Turn the PTO to the off position, engage the parking brake, turn the engine off, and remove the key. Remove the mower deck (see "Mower deck removal").
2. Turn the mower deck over and check the position of the blades. The blades must be positioned perpendicular to each other as shown in Figure 20. If not, proceed to step 3.
3. Use a block of wood (B, Figure 19) to prevent blade rotation while loosening the capscrew.
4. Remove the capscrew (A), spring washer (F), and spline washer (G).
5. Remove the alignment pin (E). Rotate the blade (D) manually until the blades are perpendicular to each other as shown in Figure 20. It may be necessary to remove and rotate the blade adapter (C) to align the blade hole and adapter hole.
6. Reinstall the alignment pin (E), spline washer (G), spring washer (F) and capscrew (A). Use a wooden block (B) to prevent blade rotation while tightening the capscrew (A) to 61-75 N.m (45-55 ft. lbs.).

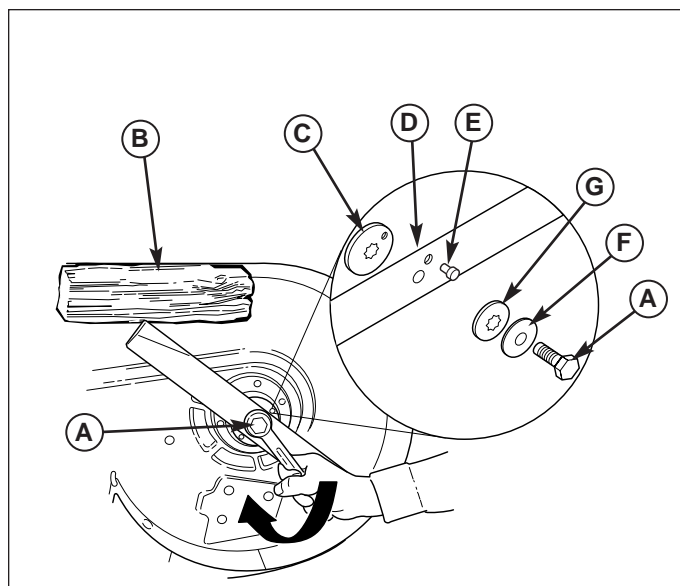


Figure 19. Blade Installation & Hardware
A. Blade Mounting Capscrew
B. 4x4 Wood Block
C. Blade Adapter
D. Blade
E. Alignment Pin
F. Spring Washer
G. Spline Washer

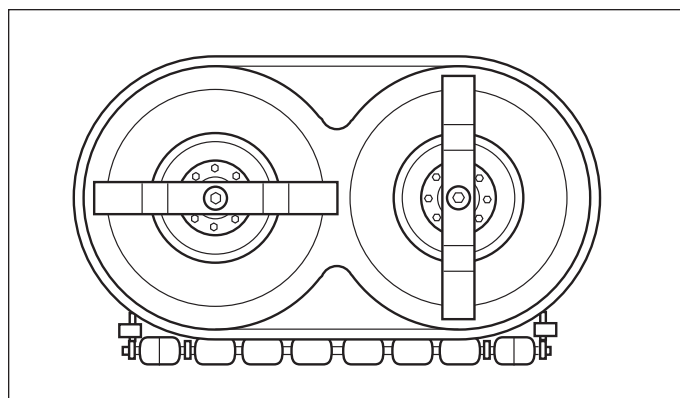


Figure 20. Check Blade Timing

Troubleshooting, Adjustment, & Service



TROUBLESHOOTING

While normal care and regular maintenance will extend the life of your equipment, prolonged or constant use may eventually require that service be performed to allow it to continue operating properly.

The troubleshooting guide below lists the most common problems, their causes and remedies.

See the information on the following pages for instructions on how to perform most of these minor adjustments and service repairs yourself. If you prefer, all of these procedures can be performed for you by your local authorized dealer.

WARNING

To avoid serious injury, perform maintenance on the tractor or mower only when the engine is stopped and the parking brake engaged.

Always remove the ignition key, disconnect the spark plug wire and fasten it away from the plug before beginning the maintenance, to prevent accidental starting of the engine.

TROUBLESHOOTING THE TRACTOR

SYMPTOM	PROBLEM	SOLUTION
Engine will not turnover or start.	1. Clutch/Brake pedal not depressed.	1. Depress pedal.
	2. PTO (electric clutch) switch in ON position.	2. Place in OFF position.
	3. Out of fuel.	3. If engine is hot, allow it to cool, then refill the fuel tank.
	4. Engine flooded.	4. Move control out of CHOKE position.
	5. Circuit breaker tripped.	5. Wait one minute for automatic reset, replace if defective.
	6. Battery terminals dirty.	6. See Maintenance Section.
	7. Battery discharged or dead.	7. Recharge or replace.
	8. Wiring loose or broken.	8. Visually check wiring & replace broken or frayed wires. Tighten loose connections.
	9. Solenoid or starter motor faulty.	9. Repair or replace. See authorized dealer .
	10. Safety interlock switch or module faulty.	10. Replace as needed. See authorized service dealer.
	11. Spark plug(s) faulty, fouled or incorrectly gapped.	11. Clean and gap or replace. See engine manual.
	12. Water in fuel.	12. Drain fuel & refill with fresh fuel.
	13. Gas is old or stale.	13. Drain fuel & replace with fresh fuel.
	14. Operator not in seat.	14. Sit in seat.
Engine starts hard or runs poorly.	1. Fuel mixture too rich.	1. Clean air filter. Check choke adjustment (engine speed control).
	2. Spark plug faulty, fouled, or incorrectly gapped.	2. Clean and gap or replace. See engine manual.
Engine knocks.	1. Low oil level.	1. Check/add oil as required.
	2. Using wrong grade oil.	2. See engine manual.
Excessive oil consumption.	1. Engine running too hot.	1. Clean engine fins, blower screen and air cleaner.
	2. Using wrong weight oil.	2. See engine manual.
	3. Too much oil in crankcase.	3. Drain excess oil.
Engine exhaust is black.	1. Dirty air filter.	1. Replace air filter. See maintenance section.
	2. Choke control in closed position.	2. Open choke.
Engine runs, but tractor will not drive.	1. Gear Selector in neutral.	1. Shift in forward or reverse.
	2. Transmission release lever in "push" position. (Hydro models only)	2. Move into drive position.
	3. Belt is broken.	3. See Drive Belt Replacement.
	4. Drive belt slips.	4. See problem and cause below.
	5. Brake is not fully released.	5. See authorized service dealer

Troubleshooting the Tractor — Continued

SYMPTOM	PROBLEM	SOLUTION
Tractor drive belt slips.	<ol style="list-style-type: none"> 1. Clutch is out of adjustment. 2. Pulleys or belt greasy or oily. 3. Belt stretched or worn. 4. Idler pulley pivot bracket "frozen" in declutched position. 	<ol style="list-style-type: none"> 1. See authorized service dealer. 2. Clean as required. 3. Replace belt. 4. Remove idler bracket, clean and lubricate.
Brake will not hold.	<ol style="list-style-type: none"> 1. Brake is incorrectly adjusted. 2. Internal brake disc in transaxle worn. 	<ol style="list-style-type: none"> 1. See Brake Adjustment. 2. See authorized service dealer
Tractor steers hard or handles poorly.	<ol style="list-style-type: none"> 1. Steering linkage is loose. 2. Improper tire inflation. 3. Spindle bearings dry. 	<ol style="list-style-type: none"> 1. Check and tighten any loose connections. See Steering Gear Adjustment. 2. Check and correct. See Adjustment Section 3. Grease spindles. See Lubrication Section
Drive belt does not stop when clutch/brake pedal depressed.	<ol style="list-style-type: none"> 1. Belt stops or belt tension out of adjustment. 	<ol style="list-style-type: none"> 1. See authorized service dealer.

TROUBLESHOOTING THE MOWER

SYMPTOM	PROBLEM	SOLUTION
Mower will not raise.	<ol style="list-style-type: none"> 1. Lift linkage not properly attached or damaged. 	<ol style="list-style-type: none"> 1. Attach or repair.
Mower cut is uneven.	<ol style="list-style-type: none"> 1. Mower not leveled properly. 2. Tractor tires not inflated equally or properly. 	<ol style="list-style-type: none"> 1. See Mower Adjustment. 2. See Maintenance Section.
Mower cut is rough looking.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Blades are dull. 4. Mower drive belt slipping because it is oily or worn. 5. Blades not properly fastened to arbors. 	<ol style="list-style-type: none"> 1. Set to full speed. 2. Slow down. 3. Sharpen or replace blades. See Mower Blade Service. 4. Clean or replace belt as necessary. 5. See Servicing the Mower Blades.
Engine stalls easily with mower engaged.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Cutting height set too low. 4. Discharge chute jamming with cut grass. 	<ol style="list-style-type: none"> 1. Set to full throttle. 2. Slow down. 3. Cut tall grass at maximum cutting height during first pass. 4. Cut grass with discharge pointing toward previously cut area.
Excessive mower vibration.	<ol style="list-style-type: none"> 1. Blade mounting screws are loose. 2. Mower blades, arbors, or pulleys are bent. 3. Mower blades are out of balance. 4. Blades out of time. 	<ol style="list-style-type: none"> 1. Tighten to 45-55 ft.lbs. (61-75 N.m.). 2. Check and replace as necessary. 3. Remove, sharpen, and balance blades. 4. See Maintenance Section. 5. Reset timing. See Maintenance Section.
Excessive belt wear or breakage.	<ol style="list-style-type: none"> 1. Bent or rough pulleys. 2. Using incorrect belt. 	<ol style="list-style-type: none"> 1. Repair or replace. 2. Replace with correct belt.
Mower fails to drive with PTO engaged	<ol style="list-style-type: none"> 1. Idler pulley spring broken or not properly attached. 2. Mower drive belt broken. 3. PTO clutch out of adjustment. 	<ol style="list-style-type: none"> 1. Repair or replace as needed. 2. Replace drive belt. 3. Adjust PTO clutch.
Mower Blades Collide.	<ol style="list-style-type: none"> 1. Shear pin sheared off. 	<ol style="list-style-type: none"> 1. Replace shear pin.

SEAT ADJUSTMENT

Seat Slide Adjustment

The seat can also be adjusted forward and back. Move the lever (A, Figure 21), position the seat as desired, and release the lever to lock the seat into position.

TRANSMISSION PURGING

Purge the transmission if the unit is excessively noisy or lacks drive in forward or reverse.

1. Elevate the front end of the tractor using a chain hoist or floor jack. Support the front of the unit using jack-stands. Elevate the unit just high enough for the front wheels to clear the ground.
2. Activate the seat switch, depress the clutch / brake pedal, and start the engine. After the engine has started, set throttle to IDLE.
3. Release the brake pedal and fully depress the forward ground speed pedal.
4. While holding the forward ground speed pedal down, engage and disengage the transmission release valve lever (B, Figure 21) several times.
5. Fully depress the reverse ground speed pedal.
6. While holding the reverse ground speed pedal down, engage and disengage the transmission release valve lever (B) several times.
7. Engage the transmission release valve lever and stroke the transmission from full forward to full reverse several times.
8. Lower the tractor and test run for several minutes.

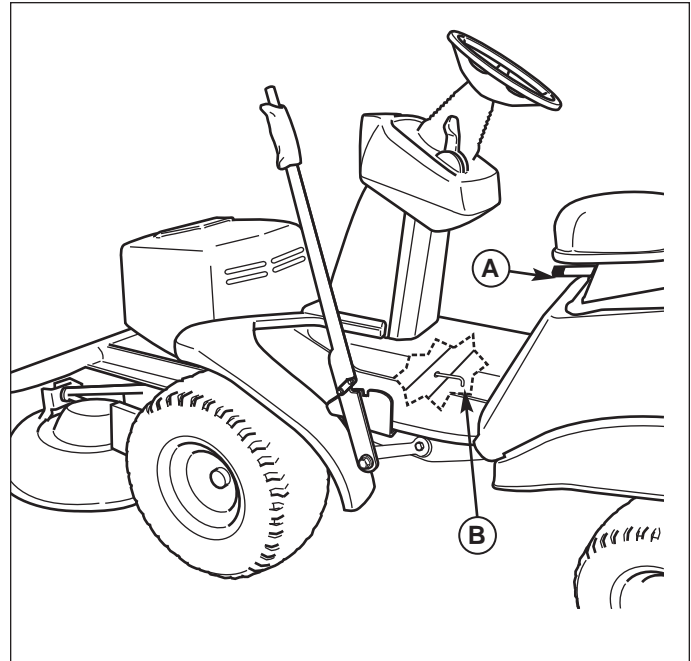


Figure 21. Seat Adjustment
A. Seat Adjustment Lever
B. Transmission Release Lever

BATTERY CHARGING

WARNING

Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.

A dead battery or one too weak to start the engine may be the result of a defect in the charging system or other electrical component. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under Cleaning the Battery & Cables in the Regular Maintenance Section.

To charge the battery, follow the instructions provided by the battery charger manufacturer as well as all warnings included in the safety rules sections of this book. Charge the battery until fully charged (until the specific gravity of the electrolyte is 1.250 or higher and the electrolyte temperature is at least 60° F). Do not charge at a rate higher than 10 amps.

STEERING WHEEL ADJUSTMENT

1. Use a suitable punch to remove the roll pin at the base of the steering wheel (B, Figure 22).
2. Pull down on the rubber boot to expose the two holes in the steering shaft (A).
3. Align the hole in the steering wheel with the appropriate steering shaft hole and install the roll pin.

NOTE: Steering wheel is factory installed with the roll pin in the top hole.

STEERING GEAR ADJUSTMENT

If there is excessive slack in the steering system, the steering gear backlash can be adjusted. Please see your authorized dealer for steering component service.

BRAKE ADJUSTMENT

1. Disengage the PTO, stop the engine, block the wheels, engage the parking brake, and remove the ignition key.
2. Locate the brake spring (A, Figure 23). With the parking brake engaged, measure the compressed spring length. The spring should be 2-7/16 (6,2 cm) or 1-1/4" (3,2 cm) when compressed.

If necessary, use the adjustment nuts (C, Figure 23) to lengthen or shorten the cable sheath to archive the correct compressed spring length.

If this adjustment does not correct a braking problem, see your dealer.

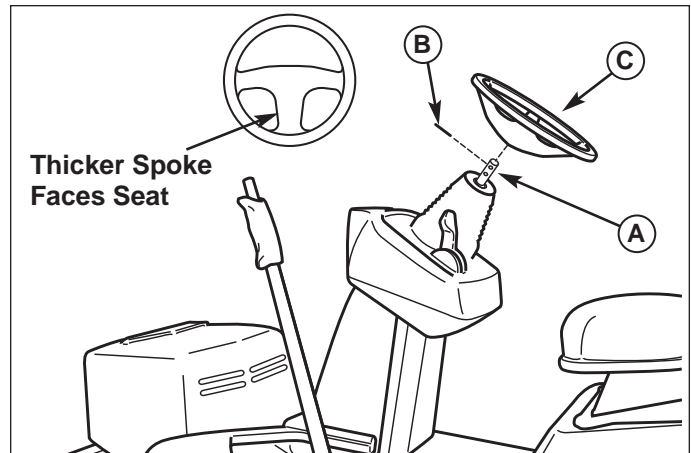


Figure 22. Steering Wheel Components

- A. Steering Shaft
- B. Roll Pin
- C. Steering Wheel

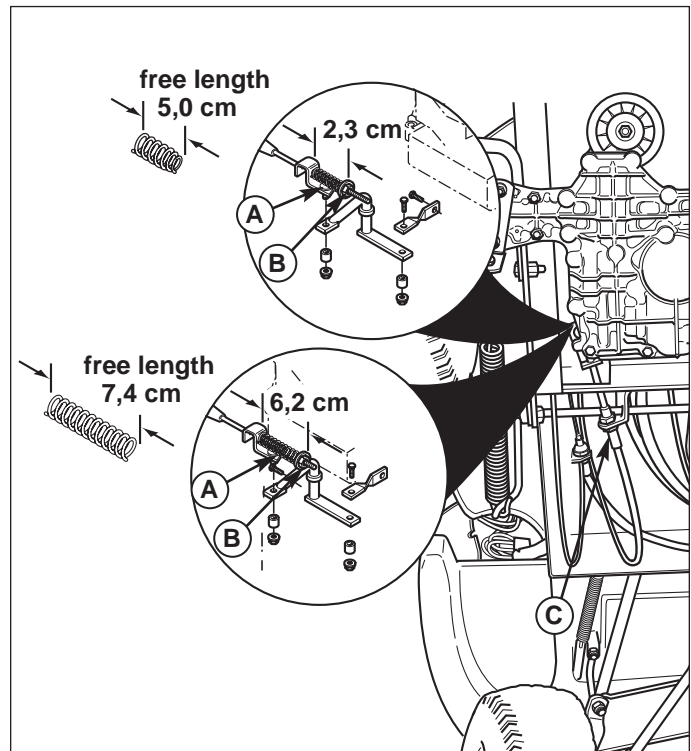


Figure 23. Brake Spring Adjustment

- A. Brake Spring
- B. Adjustment Nut
- C. Adjustment Nuts

PTO CLUTCH ADJUSTMENT

WARNING

To avoid serious injury, perform adjustments only with engine stopped, key removed and tractor on level ground.

Check the PTO clutch adjustment after the initial 25 hour break-in period and then after every 250 hours of operation. Also perform the following procedure if the clutch is slipping or will not engage, or if a new clutch has been installed.

1. Remove key from ignition switch and disconnect spark plug wires to prevent the possibility of accidental starting while the PTO is being adjusted.
2. See Figure 24. Note the position of the 3 adjustment windows (A) in the side of the brake plate and the nylock adjustment nuts (B).
3. Insert a .012"-.015" (2,5-4mm) feeler gauge (C) through each window, positioning the gauge between the rotor face and the armature face as shown in Figure 25.
4. Alternately tighten the adjustment nuts (B, Figure 24) until the rotor face and armature face just contacts the gauge.
5. Check the windows for an equal amount of tension when the gauge is inserted and removed, and make any necessary adjustments by tightening or loosening the adjustment nuts.

NOTE: The actual air gap between the rotor and armature may vary even after performing the adjustment procedure. This is due to dimensional variations on component parts, and is an acceptable condition.

6. Check the mower blade stopping time. The mower blades and mower drive belt should come to a complete stop within five seconds after the electric PTO switch is turned off.
7. Perform the BLADE BRAKE CHECK found in the MAINTENANCE Section. Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned off.

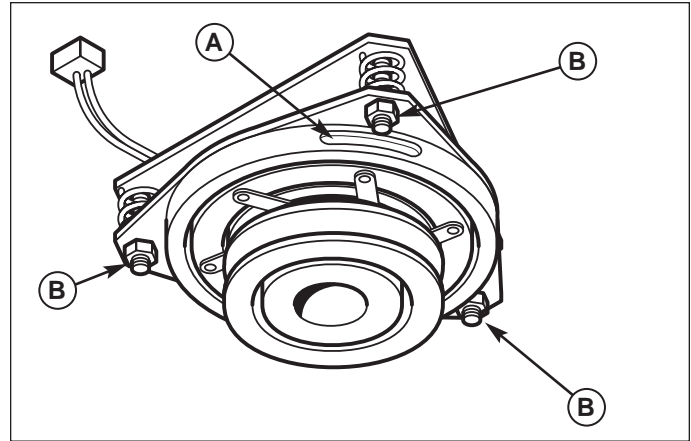


Figure 24. PTO Clutch Adjustment
A. Adjustment Window (Qty. 3, one shown)
B. Adjustment Nut

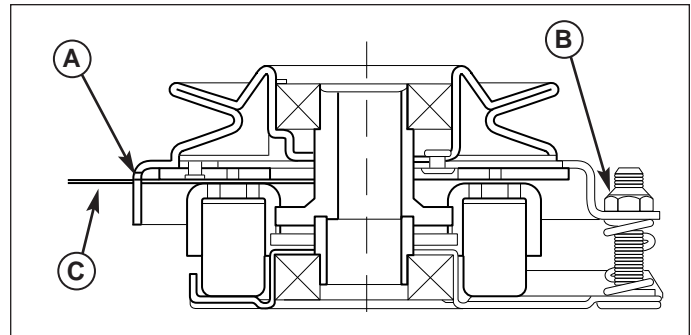


Figure 25. Adjust PTO Clutch
A. Window
B. Adjustment Nut
C. Feeler Gauge

MOWER ADJUSTMENTS

Leveling The Mower

If the cut is uneven, the mower may need leveling. Unequal or improper tire pressure may also cause an uneven cut. Make sure tire pressure is correct as specified in Checking Tire Pressure.

1. With the mower installed, place the tractor on a smooth, level surface such as a concrete floor. Turn the rear wheels straight forward.
2. Check for bent blades and replace if necessary.

SIDE-TO-SIDE LEVELING - EARLY MODELS

3. Disengage the PTO. Place the mower in mid-cut position. Arrange one of the mower blades so that it is pointing from side-to-side.
4. Measure the distance between the outside tips of each blade and the ground. If there is more than 1/8" (3mm) difference between the measurements on each side, proceed to step 5. If the difference is 1/8" (3mm) or less, proceed to step 6.
5. See Figure 26. Loosen the outside nut (A). Turn the eccentric nut (B) to raise or lower left-hand side of mower. When mower is level, hold the eccentric nut while tightening the outside nut.

SIDE-TO-SIDE LEVELING - LATER MODELS

3. Disengage the PTO. Place the mower in mid-cut position. Arrange one of the mower blades so that it is pointing from side-to-side.
4. Measure the distance between the outside tips of each blade and the ground. If there is more than 1/8" (3mm) difference between the measurements on each side, proceed to step 5. If the difference is 1/8" (3mm) or less, proceed to step 6.
5. See Figure 27. Hold the bolt (B) in place and turn the locknut (A) to raise or lower the side of the mower.

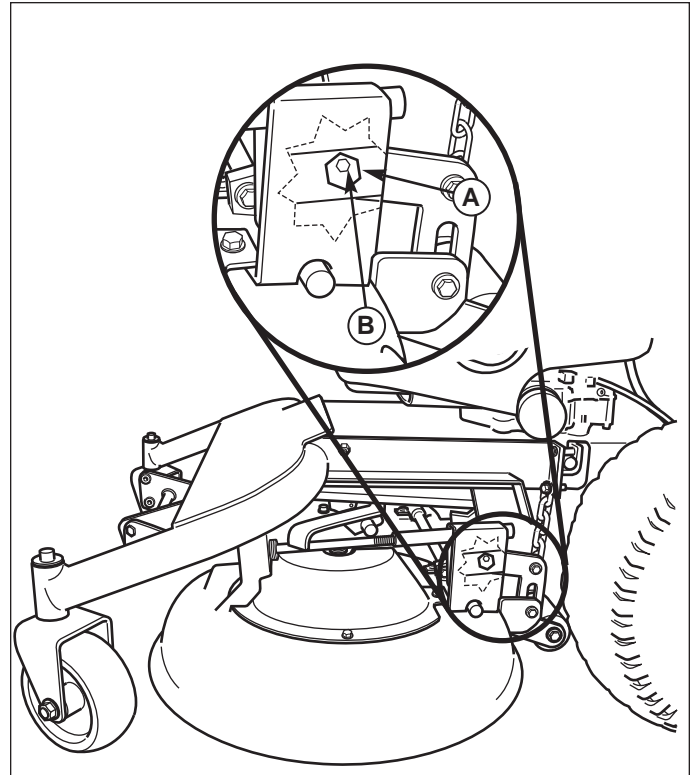


Figure 26. Side-to-Side Leveling - Early Models

A. Outside Nut
B. Eccentric Nut

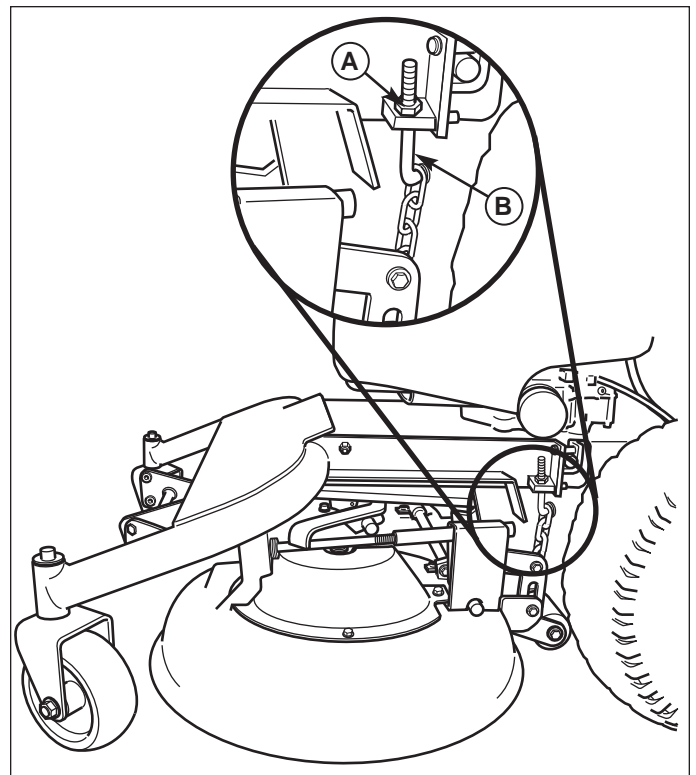


Figure 27. Side-to-Side Leveling - Later Models

A. Locknut
B. Bolt

Troubleshooting, Adjustment, & Service

FRONT-TO-BACK LEVELING - 40" MODELS

6. Arrange the blades so they face front-to-back.
7. Measure the distance from the ground to front tip and rear tip of the left and right-hand blades. Front tips should be 1/8"-1/4" (3mm-6mm) higher. If not, proceed with steps 8 - 10.
8. See Figure 28. To raise front of mower deck, loosen front nut (A) and turn rear nut (B) against bracket (C).
9. To lower front of mower deck, loosen rear nut (B) and bracket (C) will move backwards to lengthen rod.
10. Re-check measurement before tightening front nut (A) against bracket.

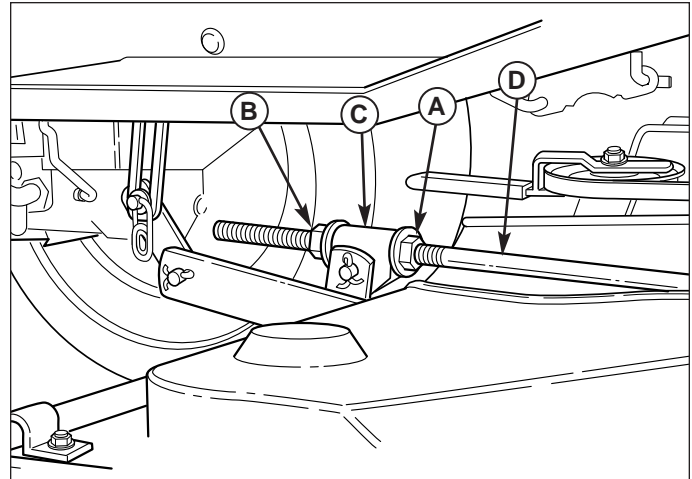


Figure 28. Front-To-Back Leveling - 40" Models

- A. Front Nut
- B. Rear Nut
- C. Mower Bracket
- D. Adjustment Rod

FRONT-TO-BACK LEVELING - 44" MODELS

6. Arrange the blades so they face front-to-back.
7. Measure the distance from the ground to front tip of the center blade and rear tip of the left or right-hand blade.

The front tip should be 1/8"-1/4" (3mm-6mm) higher than the rear. If not, proceed with steps 8-9.
8. Loosen the jam nut (B, Figure 29) and turn the eccentric nut (A) to adjust the front-to-back level.
9. Tighten the jam nut (B).

NOTE: If proper front-to-back adjustment cannot be achieved using the eccentric (A, Figure 29), adjust the bolts (B, Figure 27) to raise or lower the back of the mower.

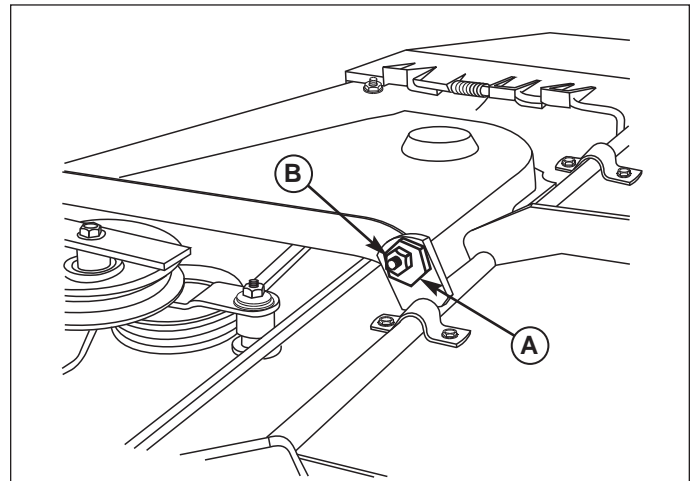


Figure 29. Front-To-Back Leveling - 44" Models

- A. Eccentric Nut
- B. Jam Nut

MOWER BELT REPLACEMENT

40" Mower PTO Belt Replacement

1. With the mower deck installed, park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
2. Remove the right belt cover.
3. Move the spring loaded lever to relieve tension on the PTO belt. Remove the PTO belt from the idler (D, Figure 30) and engine pulley (B).
4. Loosen the backside idler hardware and remove the belt from the backside idler pulley (A).
5. Install the new belt (C) as shown.
6. Tighten the backside idler (A) hardware.

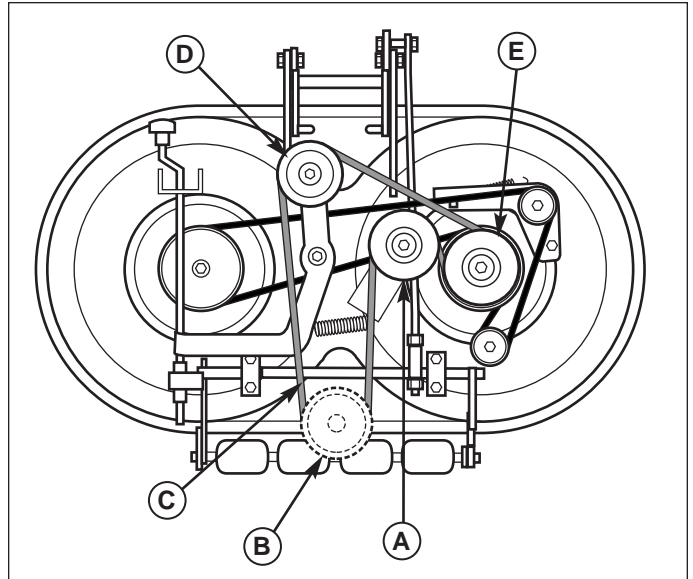


Figure 30. PTO Belt Replacement

- A. Backside Idler Pulley**
- B. Engine PTO Clutch Pulley**
- C. PTO Belt**
- D. V-Idler Pulley**
- E. Mower Deck Drive Pulley**

44" Mower PTO Belt Replacement

1. With the mower deck installed, park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
2. Move the spring loaded lever to relieve tension on the PTO belt. Remove the PTO belt from the idler (D, Figure 31) and engine pulley (B).
3. Install the new belt (C) as shown.

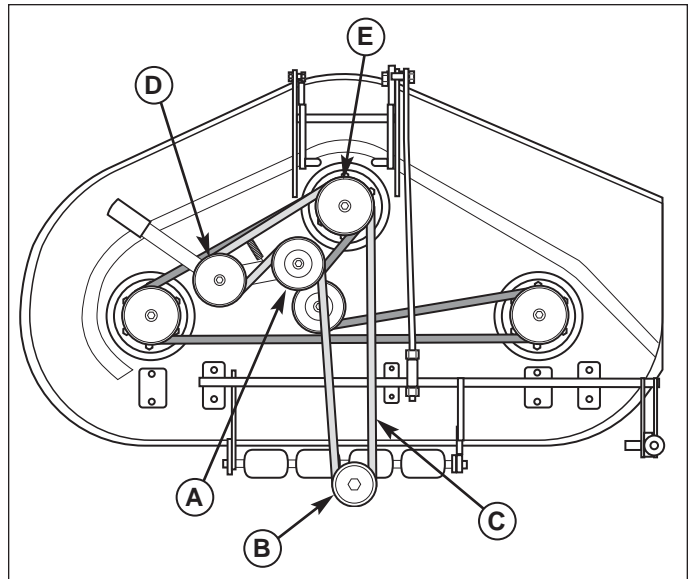


Figure 31. PTO Belt Replacement

- A. Backside Idler Pulley**
- B. Engine PTO Clutch Pulley**
- C. PTO Belt**
- D. V-Idler Pulley**
- E. Mower Deck Drive Pulley**

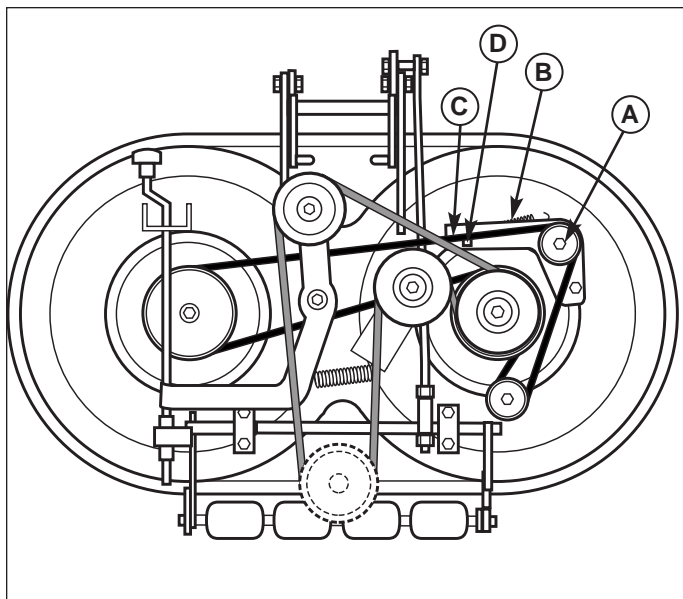


Figure 32. Mulching Deck (Belt Covers Removed)

- A. Idler Assembly Capscrew**
- B. Spring-Loaded Idler Assembly**
- C. Belt**
- D. Square Hole**

40" Mower Arbor Drive Belt Replacement

1. With the mower deck installed, park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
2. Remove the belt covers. Remove the PTO belt.
3. Loosen the idler assembly capscrew (A, Figure 32).
4. Using a ratchet (A, Figure 33), insert the end of the extension into the square hole (D, Figure 32) and move the idler assembly (B, Figure 32) to relieve tension on the belt (C).
5. Remove the belt (C).
6. Install a new belt (C) on the pulleys as shown. Releasing the idler assembly (A) allows the spring to automatically tension the cogged belt.
7. Tighten the idler assembly capscrew (A). Reinstall the belt covers.
8. Check that the blades are positioned perpendicular to each other (see Figure 34). If not, perform the mower blade timing procedure found in the Regular Maintenance section.

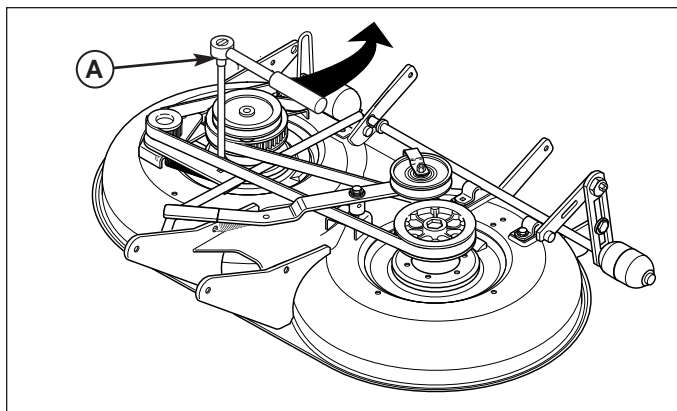


Figure 33. Release Cogged Belt Tension
A. 3/8" Ratchet and Extension

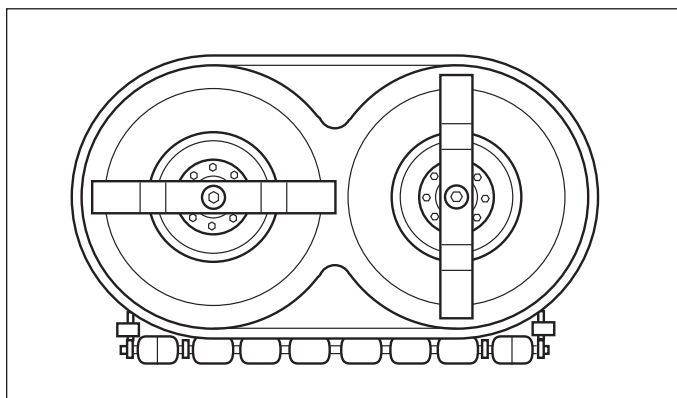


Figure 34. Mower Blade Timing

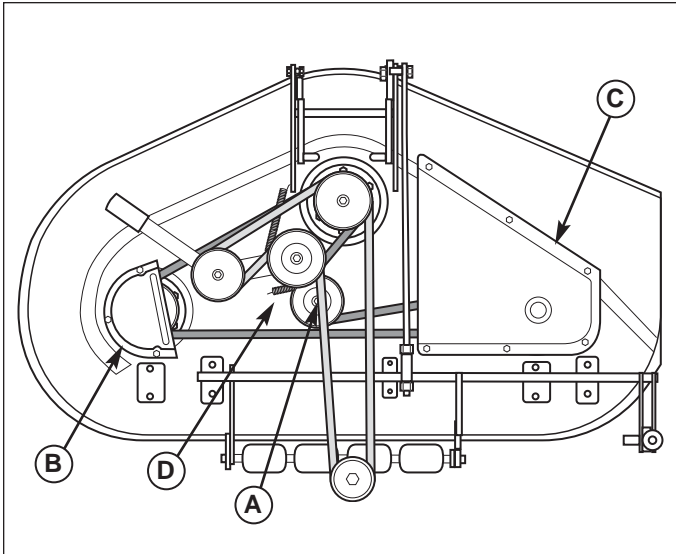


Figure 35. Mower Deck - 44" & 50" Mowers

- A. Capscrew
- B. Left-hand Arbor Cover
- C. Right-hand Arbor Cover
- D. Spring

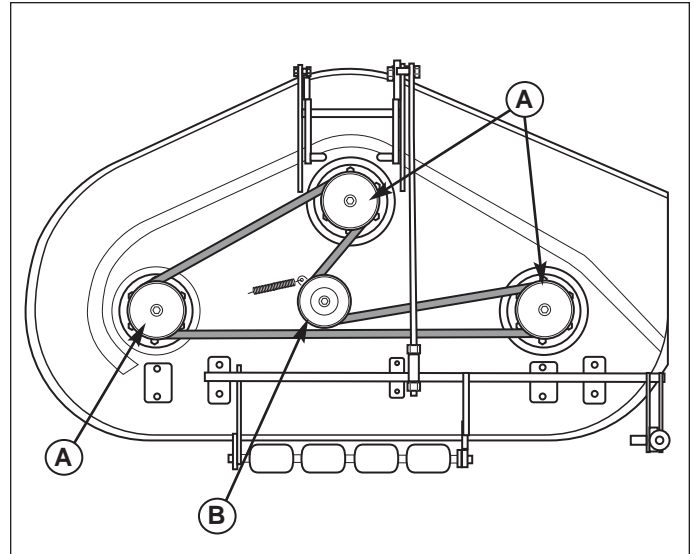


Figure 36. Mower Deck Drive Belt Routing All Models

- A. Arbor Drive Pulley (V-sided)
- B. Idler Pulley (Flat-sided)

44" Mower Arbor Drive Belt Replacement

NOTE: Be sure to use only genuine Simplicity replacement parts.

1. Park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, turn off the engine and lock the parking brake. Remove the key.
2. Remove the mower from the tractor. See Mower Removal in the Operation section.
3. Remove the capscrews securing the right-hand arbor cover (B, Figure 35). Remove three capscrews securing left-hand arbor cover (D).
4. Using a pair of locking pliers or a spring puller, remove the idler pulley spring (C, Figures 35) from slot in deck.
5. Loosen capscrew (A, Figure 35) securing the idler pulley to the bracket. The belt can now be slipped between the pulley and idler bracket hub.
6. Install a new belt as shown in Figure 36. Make sure that V-side of belt runs in arbor pulley (A) grooves and flat side of belt runs against idler pulley (B).
7. Tighten the capscrew (A, Figure 35).
8. Reinstall spring (C) into its slot in mower deck.
9. Reinstall the left and right arbor covers (B & C).
10. Install the mower onto the tractor.

Specifications, Parts, & Accessories



NOTE: Specifications are correct at time of printing and are subject to change without notice.

** Actual sustained equipment horsepower will likely be lower due to operating limitations and environmental factors.*

ENGINE:

15 HP*

Make	Briggs & Stratton
Model	OHV 31F777
Horsepower	15 @ 3600 rpm
Displacement	30.6 Cu. in (502 cc)
Electrical System	12 Volt, 16 amp. Alternator, Battery: 230 CCA
Oil Capacity	1.5 Quarts (1,4 L)

16 HP*

Make	Briggs & Stratton
Model	Vanguard
Horsepower	16 @ 3600 rpm
Displacement	29.3 Cu. in (480 cc)
Electrical System	12 Volt, 16 amp. Alternator, Battery: 230 CCA
Oil Capacity	1.75 Quarts (1,7 L)

17 HP*

Make	Briggs & Stratton
Model	OHV 31F777
Horsepower	17 @ 3600 rpm
Displacement	30.6 Cu. in (502 cc)
Electrical System	12 Volt, 16 amp. Alternator, Battery: 230 CCA
Oil Capacity	1.5 Quarts (1,4 L)

CHASSIS:

Fuel Tank Cap.	Capacity: 5 Gallons (18,9 L)
Rear Wheels	Tire Size: 15 x 6.00-6 Inflation Pressure: 12-15 psi (.8-1 bar)
Front Wheels	Tire Size: 18 x 8.50-8 Inflation Press.: 15 psi (1 bar)

TRANSMISSION:

K46

Type	Hydrostatic Tuff Torq K46
Hydraulic Fluid	10w 30 Premium Engine Oil
Capacity	2.6 qt (2,5 L)
Speeds	Forward: 4.1 MPH (6,6 km/h) Reverse: 2,6 MPH (4,2 km/h)
@ 3400 rpm	
Continuous Torque Output	215 ft. lbs. (291 N.m.)
Drawbar Rating	440 lbs. (200 Kg)
Maximum Weight on Axle	584 lbs. (265 Kg)

DIMENSIONS

Overall Length	83" (210 cm)
Overall Width	48" (122 cm)
Height	49" (125 cm)
Weight (approx.)	
Lancer / 4400 Series Tractor	
Tractor	525 lbs. (238 kg)
44" Mower Deck	107 lbs. (49 kg)
40" Mower Deck	107 lbs. (49 kg)

REPLACEMENT PARTS

Replacement parts are available from your authorized dealer. Always use genuine Simplicity Service Parts.

MAINTENANCE ITEMS

Many convenient and helpful service and maintenance items are available from your authorized dealer. Some of these items include:

Engine Oil	Tire Sealant
Touch-Up Paint	Degreaser/Degreaser
Grease Gun Kit	Gas Stabilizer
8 oz. Grease Tube	

TECHNICAL MANUALS

Additional copies of this manual are available, as well as fully illustrated parts lists. These manuals show all of the product's components in exploded views (3D illustrations which show the relationship of parts and how they go together) as well as part numbers and quantities used. Important assembly notes and torque values are also included.

For applicable manuals currently available for your model, contact our Customer Publications Department at 262-284-8519. Have the information listed in the box below available when phoning in your request.

Technical manuals can be downloaded from www.simplicitymfg.com

Model:	_____
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Simplicity

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